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Pathways from insecure attachment to depressive symptoms and disordered eating in adolescents: Multiwave integrative model

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PATHWAYS FROM INSECURE ATTACHMENT TO DEPRESSIVE SYMPTOMS AND DISORDERED EATING IN ADOLESCENTS: MULTIWAVE INTEGRATIVE MODELS

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ESCUELA DE DOCTORADO INTERNACIONAL DE LA USC
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PATHWAYS FROM INSECURE ATTACHMENT TO DEPRESSIVE SYMPTOMS AND DISORDERED EATING IN ADOLESCENTS: MULTIWAVE INTEGRATIVE MODELS

Dna. Laura Cristina Cortés García

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PATHWAYS FROM INSECURE ATTACHMENT TO DEPRESSIVE SYMPTOMS AND DISORDERED EATING IN ADOLESCENTS: MULTIWAVE INTEGRATIVE MODELS

Dña. Carmen Senra Rivera

INFORMA:

Que la presente tesis, corresponde con el trabajo realizado por Dña. ***Laura Cristina Cortés García****, bajo mi dirección, y autorizo su presentación, considerando que reúne los requisitos exigidos en el Reglamento de Estudios de Doctorado de la USC, y que como directora de ésta no incurre en las causas de abstención establecidas en Ley 40/2015.*

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Conflicto de interés

La doctoranda, Laura Cristina Cortés García, declara no tener ningún conflicto de interés en relación con esta tesis doctoral.

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Dedico esta tesis doctoral a mis dos figuras de apego:
a ti, Papá, y a ti, Mamá,
por ser la luz y el cayado
que siempre me ilumina y sostiene
en el camino de la vida.
Porque en vuestra alianza eterna, nada me falta.

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Si el pintor entierra sus pinceles
y la bailarina sus zapatillas.
Si el cantor se calla
y el sabio olvida.
Si se apaga el fuego.
Si muere el viento.
Si se seca el pozo.
Si el novelista deja de imaginar
y el fotógrafo cierra los ojos…

… ¿Quién dibujará las olas?
¿Quién trazará,
con su cuerpo, siluetas imposibles?
Nadie cantará.
Se disipará la memoria,
maestra de niños
y roca de ancianos.
Huirá el calor de la piel, y del alma.
Se detendrá el molino.
Se extenderá la sed por el mundo.
Los pobladores de relatos eternos
no llegarán a nacer.
Nadie apresará la magia fugaz de un instante.

¡No bajes los brazos!
¡No entierres el talento
en la tierra amarga de la inseguridad
y el desaliento!
¿Cuándo descubrirás
la grandeza que hay en tus manos,
el poder que hay en tus sueños?

José María R. Olaizola SJ

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Pathways from insecure attachment to depressive symptoms and disordered eating in adolescents: Multiwave integrative models

ABSTRACT

Broad research supports the influence of insecure attachment on the subsequent development of eating and depressive symptoms in children and adolescents. The majority of prospective studies analyzing such associations have been based on the assumption that insecure attachment, mainly to the mother, had a direct and unidirectional effect on the development of psychopathology. However, it is more plausible that this relationship may be rather explained by intermediate mechanisms that converge in the link insecure attachment-eating and depressive symptoms. It is also important to consider the possible reverse effect that such psychopathology may have on the quality of attachment relationships. Despite the growing number of studies in this area, no research has proposed a model capable of elucidating the interaction between the aforementioned variables to date. Consequently, the present Doctoral Thesis, from a developmental-gender perspective, addressed the following main objectives: (1) to examine the reciprocal associations between attachment (mother, father and peers, separately) and disordered eating and (2) depressive symptoms in the transition from middle childhood to adolescence (N = 904), (3 and 4) to identify and measure the main mediators that explain the association between quality of attachment and eating and depressive psychopathology conducting two meta-analyses and (5) to test a mediational model whereby insecure attachment prospectively exerts its effect on the development of disordered eating via depressive symptoms. The results showed that secure attachment with parents, particularly with the mother, was a significant protective factor against the subsequent development of both eating and depressive psychopathology, especially in girls. Furthermore, it was found that eating and depressive symptoms significantly eroded attachment relationships with mothers, most notably in the case of girls. The findings of the two meta-analyses evidenced, on the one hand, that in the attachment-disordered eating link, depressive symptoms and

emotional dysregulation were the mediators with the largest effect size and, on the other hand, that in the attachment-depression association, the most robust effect sizes corresponded to mechanisms pertaining to the cognitive and emotional domains. Finally, the proposed mediation model revealed that insecure attachment relationships with the mother (rather than with the father) predicted the development of disordered eating via depressive symptoms in boys and girls. In conclusion, the findings of this Doctoral Thesis not only emphasize the importance to promote secure mother-child attachment relationships during the transition to adolescence in boys and girls as a protective factor against developing eating problems and depressive symptoms, but also provide empirical evidence on the different pathways of developing disordered eating and depressive symptoms from insecure attachment and the detrimental influence of such psychopathology on the quality of parent-child attachment relationships.

Keywords
Attachment, adolescence, depressive symptoms, disordered eating, mediators

Vías desde el apego inseguro a los síntomas depresivos y alimentarios en adolescentes: Modelos longitudinales integradores

RESUMEN

Amplia investigación respalda la influencia del apego inseguro en el desarrollo posterior de síntomas alimentarios y depresivos en niños y adolescentes. La mayoría de los estudios prospectivos que analizaron estas asociaciones se basaron en la suposición del efecto directo y unidireccional del apego, principalmente con la madre, en el desarrollo de psicopatología. Sin embargo, es más plausible que dicha relación pueda explicarse por el concurso de variables intermedias que cooperan en el vínculo apego-síntomas alimentarios y depresivos. También es importante considerar el posible efecto recíproco que pueda ejercer la psicopatología sobre la calidad de las relaciones de apego. Aunque se trata de un área de investigación muy activa, hasta el momento siguen sin respuesta varios interrogantes cuyas respuestas son esenciales para conocer cómo se interrelacionan las mencionadas variables. La presente Tesis Doctoral, desde una perspectiva evolutiva de género, avanza en este conocimiento mediante la formulación de los siguientes objetivos: (1) examinar prospectivamente las asociaciones recíprocas entre calidad del apego (madre, padre y compañeros, independientemente) y los síntomas alimentarios y (2) depresivos en la transición a la adolescencia (N = 904); (3 y 4) identificar y medir, mediante metaanálisis, los principales mediadores que podrían explicar tales asociaciones; y (5) proponer un modelo mediacional integrador que ponga a prueba si la sintomatología depresiva es el nexo a través del cual el apego inseguro ejerce prospectivamente su efecto sobre el desarrollo de sintomatología alimentaria. Los resultados mostraron que la calidad de la relación de apego con los padres, particularmente con la madre, es un factor de protección significativo frente al desarrollo posterior de psicopatología tanto alimentaria como depresiva, sobre todo en las niñas. Además, se pudo comprobar que los síntomas alimentarios y depresivos erosionaron significativamente las relaciones de apego con las madres, de manera más destacada en el caso de las niñas. Los resultados de los metaanálisis evidenciaron, por una parte,

que el vínculo apego-síntomas alimentarios, tiene lugar gracias al concurso de los síntomas depresivos y la desregulación emocional y, por otra parte, que en la asociación apego-depresión, los tamaños del efecto más robustos se corresponden con mecanismos de los dominios cognitivo y emocional. Por último, el modelo de mediación propuesto dio cuenta de que el apego inseguro con la madre predice el desarrollo de síntomas alimentarios vía síntomas depresivos en niños y niñas. En conclusión, los hallazgos de esta tesis doctoral no sólo ponen el acento en la calidad de las relaciones de apego madre-hijo durante la transición a la adolescencia en ambos sexos, sino que, además, aportan información sobre las vías de desarrollo y las edades críticas de los problemas alimentarios y depresivos, de su efecto recíproco en la calidad de las relaciones de apego padres-hijos.

Palabras clave
Apego, adolescencia, síntomas depresivos, síntomas alimentarios, mediadores

Vías dende o apego inseguro a os síntomas depresivos e alimentarios en adolescentes: Modelos lonxitudinais integradores

RESUMO

Ampla investigación apoia a influencia do apego inseguro no desenvolvemento posterior de síntomas alimentarios e depresivos en nenos e adolescentes. A maioría dos estudos lonxitudinais que analizaron estas asociacións baseáronse na suposición do efecto directo e unidireccional do apego, principalmente coa nai, no desenvolvemento destas psicopatoloxías. Con todo, é máis plausible que dita relación poida explicarse polo concurso de variables intermedias que cooperan no vínculo apego-síntomas alimentarios e depresivos. Tamén é importante considerar o posible efecto recíproco que poida exercer a psicopatoloxía sobre a calidade das relacións de apego. Aínda que se trata dun área de investigación moi activa, ata o momento non foi proposto un modelo capaz de aclarar o interxogo entre as mencionadas variables. A presente Tese Doutoral, dende unha perspectiva evolutiva de xénero, avanza neste coñecemento mediante a formulación dos seguintes obxetivos: (1) examinar prospectivamente as asociacións recíprocas entre calidade do apego (nai, pai e compañeiros, de forma independente) e síntomas alimentarios e (2) depresivos na transición da infancia media á adolescencia (N = 904), (3 e 4) identificar e medir, a traves de metaanálises, os principais mediadores que poderían explicar tales asociacións e (5) expor un modelo mediacional no que se examina se a sintomatoloxía depresiva é o nexo a través do cal o apego inseguro exerce prospectivamente o seu efecto sobre o desenvolvemento de sintomatoloxía alimentaria. Os resultados mostraron que a calidade da relación de apego cos pais, particularmente coa nai, é un factor de protección significativo ante o desenvolvemento posterior de psicopatoloxía tanto alimentaria como depresiva, sobre todo nas nenas. Ademais, púidose comprobar que os síntomas alimentarios e depresivos erosionaron significativamente as relacións de apego coas nais, de maneira máis destacada no caso das nenas. Os resultados dos metaanálises evidenciaron, por unha banda, que o vínculo apego-síntomas alimentarios, ten lugar gracias ao concurso dos síntomas

depresivos e á desregulación emocional e, por outra banda, que na asociación apego-depresión, os tamaños do efecto máis robustos se corresponden con mecanismos cognitivos e emocionais. Por último, o modelo de mediación proposto confirmou que, as relacións de apego inseguro coa nai (máis que co pai) predín o desenvolvemento de síntomas alimentarios vía síntomas depresivos en nenos e nenas. En conclusión, os achados desta tese doutoral non só poñen o acento na calidade das relacións de apego nai-fillo durante a transición á adolescencia en ambos os sexos, senón que, ademais, achegan información sobre as vías de desenvolvemento e idades críticas dos problemas alimentarios e depresivos e do seu efecto recíproco na calidade das relacións de apego pais-fillos.

Palabras clave

Apego, adolescẽncia, síntomas depressivos, síntomas alimentarios, mediadores

LIST OF STUDIES RELATED WITH THE GENERAL OBJECTIVES OF THE DOCTORAL THESIS
(See Appendix 1)

Published in peer-reviewed journals

Study 1 (Ojective 1)

Cortés-García, L., Hoffmann, S., Warschburger, P., & Senra, C. (2019). Exploring reciprocal relationships between adolescent's perceptions of parental and peer attachment and disordered eating: A multiwave cross-lagged panel analysis. *International Journal of Eating Disorders*, 1-11. doi: 10.1002/eat.23086
JCR: Impact factor = 3.523. Quartile: Psychology (Q1)

Study 2 (Ojective 2)

Cortés-García, L., Wichstrøm, L., Viddal, K., & Senra, C. (2019). Prospective bidirectional associations between attachment and depressive symptoms from middle childhood to adolescence. *Journal of Youth and Adolescence,* 48, 2099-2113. doi: 10.1007/s10964-019-01081-4
JCR: Impact factor = 3.259. Quartile: Psychology, Developmental (Q1)

Study 3 (Ojective 3)

Cortés-García, L., Takkouche, B., Seoane, G., & Senra, C. (2019). Mediators linking insecure attachment to eating symptoms: A systematic review and meta-analysis. *PLoS ONE*, *14*(3). https://doi.org/10.1371/journal.pone.0213099
JCR: Impact factor = 2.776. Quartile: Multidisciplinary sciences (Q2)

Under review in peer-reviewed journals

Study 4 (Ojective 4)

Cortés-García, L., Rodriguez-Cano, R., Takkouche, B., Seoane, G., & Senra, C. (April, 2020). Insecure attachment style and

depressive symptoms: A meta-analysis of mediators. Under review in *Journal of Affective Disorders*.
JCR: Impact factor = 4.084. Quartile: Psychiatry (Q1)

Study 5 (Ojective 5)

Cortés-García, L., Wichstrøm, L., Viddal, K., & Senra, C. (September, 2019). The mediating role of depressive symptoms in the relationship between attachment insecurity and disordered eating across adolescence: A multiwave prospective study. Revised and resubmitted in *Development and Psychopathology.*
JCR: Impact factor = 3.593. Quartile: Psychology, Developmental (Q1)

INDEX

I. INTRODUCTION

1. INTRODUCTION

Adolescence is considered as one of the most dynamic, broad and influential periods of life span. From a developmental perspective, the transition to adolescence represents a compelling period characterized by significant changes that affect children's neurobiological, psychical, affective, cognitive and social functions (e.g., Crosnoe & Johnson, 2011). Moreover, adolescence is marked by striking transformations in youths' social worlds (Rudolph, 2009). As children move into adolescence and their social context expands, they begin to spend less time with their parents (autonomy from parents) and interact more often with peers and other adults. This socialization process requires new competencies to explore and to master new environments and the ability to integrate representations of different relationships into an overall diagram (Kerns & Brumariu, 2016). These shifts in the dynamics of interpersonal relationships necessitate a new balance between personal and interpersonal resources (Rudolph, 2009). At the same time that adolescents seek to develop greater emotional self-sufficiency and autonomy vis-à-vis their parents (i.e., primary attachment figures) and more closeness to peers, they also negotiate ways to preserve the relationships with their primary attachment figures (Allen & Tan, 2016; Rosenthal & Kobak, 2010). These complex metamorphoses, which take place more or less simultaneously and within a relatively short time, provide a context of risk for the emergence of mental health problems, especially in youth with compromised ability to face the numerous challenges of adolescence (Casey et al., 2008; Lerner & Steinberg, 2004). In this regard, research documents striking increases in multiple forms of psychopathology early in adolescence, including Eating disorders (EDs) (e.g., Smink et al., 2012) and Depression (e.g., Hankin et al., 2015; Thapar et al., 2012). Both disorders have a dramatic increase in their prevalence in the transition to adolescence, leading to suffering and disability among adolescents (Smink et al., 2012; Thapar et al., 2012). Thus, improving the understanding of such disorders and of the

risk factors contributing to their development, persistence, and amelioration could help in their early detection, treatment and prevention.

Both EDs and depression are recognized as major public health issues. EDs typically emerge and reach their highest prevalence during adolescence (e.g., Smink et al., 2012). EDs are associated with severe negative implications for social, emotional, and functional well-being, high rates of persistence and recurrence (Klein & Walsh, 2004), and are often accompanied by serious medical complications (Klump et al., 2009). In addition, EDs present higher mortality rates compared with the standard population norms as well as higher suicide rates (Ágh et al., 2016; Arcelus et al., 2011) – in fact, anorexia nervosa (AN) is among the most difficult mental disorders to treat and has the highest mortality rate of all the psychiatric disorders (e.g., Arcelus et al., 2011). Furthermore, depression is a seriously impairing, commonly occurring and frequent recurrent mental disorder worldwide that produces enormous socioeconomic costs (Greenberg et al., 2015; Kessler, 2012). Adolescents who have experienced depressive disorders report a high risk for relapse and recurrent emotional problems in adulthood (Cicchetti & Toth, 2009). The consequences for adolescent depression include academic failure, poor peer relations, behavioral problems, conflict with parents and authority figures, substance abuse and interruption of development towards cognitive maturity (Lemstra et al., 2008). Moreover, depression in adolescents substantially increases the risk of suicide, representing the second-to-third leading cause of death in this age group (Miret et al., 2013).

It is noteworthy that many adolescents experience subthreshold forms of EDs (i.e., disordered eating such as fasting, vomiting, and laxative use for weight loss; e.g., Ackard et al., 2011; Chamay-Weber et al., 2005; Neumark-Sztainer et al., 2011) and depression (e.g., Carrellas et al., 2017; Wesselhoeft et al., 2013) but nonetheless undergo similar psychological impairment as those recognized as clinically affected. Both disordered eating and depressive symptoms are particularly widespread in adolescence and have a detrimental impact on health and psychosocial functioning (e.g., Ayuso-Mateos

et al., 2010; Stice et al., 2009), even beyond increasing the risk for later EDs (Stice & Bearman, 2001) or depressive disorders (Lewinsohn et al., 2000). In addition to the noticeable increase in these psychopathologies in the transition from middle childhood to adolescence, another salient developmental feature is the emergence of gender differences in both disorders. Although this topic is beyond the scope of the current thesis, both depression and eating problems rise disproportionately in girls relative to boys over this developmental period (Ferreiro et al., 2012; Measelle et al., 2006). Also, female adolescents have been found to display high rates of co-occurring depressive and eating psychopathology (Graber & Brooks-Gunn, 2001; Stice et al., 2001), encouraging more research on their developmental trajectories (i.e., temporal precedence) and common features in these two disturbances (Ferreiro et al., 2012, 2014; Measelle et al., 2006). In consequence, this transition represents a critical developmental period to identify and understand processes that might be supporting both disorders and explaining gender differences. Given the complexity underlying this stage of development, reciprocal and dynamic models capable of elucidating the transactional relationships between the different risk factors involved in these psychopathologies are needed. Such increased understanding will ultimately underpin the development of empirically supported treatment approaches, as well as the creation of more effective prevention programs.

It has been suggested that insecure attachment is one of the most robust candidates that can operate as a risk factor (e.g., Brumariu & Kerns, 2010; Madigan et al., 2013; Tasca, 2018; Tasca & Balfour, 2014). Bowlby's Attachment Theory (1969/1982) established an important developmental framework for understanding *how* the quality of these early attachment relationships could be implicated in the development and maintenance of eating and depressive psychopathology (e.g., Morley & Moran, 2011; Tasca, 2018). Built on the logic of Attachment Theory, children develop mental representations about themselves and the social world based on the early caregiving environment – known as *Internal Working Models, IWMs*) – and such representations have important implications for

their future psychosocial functioning (Bowlby, 1973). Internal working models, which are organized by secure base scripts, provide individuals with valuable resources for coping with attachment disruptions (Kobak et al., 2016). For instance, when facing distress, securely attached children are able to openly signaling their needs and activate adaptive emotion regulation strategies. In contrast, experiences with harsh, inconsistent or diminished levels of caregiver's availability undermine children's ability to rely on their parents as secure base and give rise to more inflexible and self-critical *IWMs* (Belsky, 2016; Mikulincer & Shaver, 2012). When facing distress, those children with insecure *IWMs* use less adaptive emotion regulation strategies, such as a tendency to withdraw from important others and restrict their emotions (*avoidant attachment*) or to cling to important others and to become overwhelmed by emotions (*anxious attachment*), thereby increasing the risk for psychopathology (Gentzler et al., 2010). Patterns of insecure attachment have indeed been documented to be predictors of a wide array of child mental health problems (e.g., Sroufe, 2016; Thompson, 2016).

Bowlby's Attachment Theory suggests a strong link between negative early relationships with caregivers and the development of eating and depressive psychopathology (DeKlyen & Greenberg, 2016). In consequence, much of the research has addressed this association as a direct and unidirectional one, assuming a considerable continuity in *IWMs* from infancy through adulthood (Kobak et al., 2017; Kobak & Zajac, 2011). However, the meaning and expression of attachment-related cognition, behavior and affect experience profound changes across adolescence (Allen & Tan, 2016). Some attachment researchers consider that early attachment representations are revised and updated in light of ongoing experience and consequently may or may not correspond to later attachment representations (Fraley, 2002). As Weinfield et al. (2004) stated: "*Bowlby's (1988) theory included a pathway model that allowed for events and circumstances to intervene in attachment relationships and representations over time, changing security to insecurity or vice-versa*". In fact, studies that have looked at correlates of change from infancy to adolescence have found only modest continuity with

qualities of attachment relationships earlier in lifespan (e.g., Groh et al., 2014; Pinquart et al., 2013; Weinfield et al., 2004). As a result, there is ample room for questioning both stability and change in the quality of attachment relationships, particularly during this transitional period. Given the malleable condition of *IWMs*, especially during the transition to adolescence, it could be possible that eating and depressive symptomatology may worsen the quality of attachment relationships as well. Nevertheless, the reverse association has never been tested. As such, it remains uncertain whether insecure attachment relationships are more likely to be the cause or consequence of eating and depressive psychopathology.

Importantly, throughout development, these mental models are updated and transferred to relationships beyond parents with other attachment figures, such as peers and romantic partners (Cassidy et al., 2013). Researchers have begun to question the relative importance of different attachment relationships in adolescent adjustment. In this regard, Bowlby recognized the existence of an *attachment hierarchy* that includes persons other than primary caregivers that vary over the course of development (Kerns & Brumariu, 2016; Zeifman & Hazan, 2016). For some authors though, parents remain the primary attachment figures until late adolescence, with mother being consistently the preferred figure to turn to in times of stress and in need for security and support (e.g., Markiewicz et al., 2006). Nevertheless, during middle childhood, youngsters develop closer relationships with peers and increasingly turn to them for comfort and, by late adolescence, for emotional support (Allen & Tan, 2016). Furthermore, boys and girls may behave differently towards their attachment figures according to gender. For instance, in times of difficulty, girls may tend to maintain relatedness with parents (perhaps especially with mothers) and to seek emotional support on others, while boys may tend to decrease their reliance on parents with age and to restrict emotions and not to share them with others (Allen & Tan, 2016). There is, therefore, the possibility that attachment to parents and to peers contribute differently to the evolution of disordered eating and depressive symptoms depending on the child's

gender. In consequence, the comprehension of the specific nature of these associations may have important practical implications.

From a methodological point of view, it is important to consider the existence of a range of potential confounders that could influence the target variables and produce spurious relations between them. This includes common genetics (Berrettini, 2004; Trace, Baker, Peñas-Lledó, & Bulik, 2013), personality or temperamental factors (e.g., impulsivity and perfectionism; Cassin & von Ranson, 2005), problematic parenting (DeKlyen & Greenberg, 2016; Striegel-Moore et al., 2005) and response style biases (Decaluwé & Braet, 2004) – and even many others that we currently are not aware of. Such, often hard-to-measure, potential third variables make etiological interpretations from observational research uncertain. However, the Dynamic Panel Model (DPM) (Bollen & Brand, 2010; Wichstrøm, Belsky, & Steinsbekk, 2017) is one data-analytical approach that enables one to discount one source of confounding, namely those that do not change their value over time, irrespective of whether they are known or not. Even though DPM narrows the gap between mere prediction and causation, time-varying factors (e.g., stressful life-events or pubertal timing [Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Striegel-Moore et al., 2005]) could still produce a spurious relation between insecure attachment and disordered eating. Nevertheless, many time-varying factors have also shown stability (e.g., life-events [Rudolph, 2009], bullying [Scholte, Engels, Overbeek, de Kemp, & Haselager, 2007]), which can be accounted for in DPM, thus ruling out one obstacle to etiological interpretation. To date, no investigation has applied DPM, or other related methodological approaches, to test prospective effects of insecure attachment on disordered eating and depressive symptoms in the transition to adolescence. Hence, we will undertake this task in the present Doctoral Thesis.

Furthermore, to advance knowledge in a substantial way, it is important to keep in mind that, although insecure attachment does influence the development of psychopathology, in most cases its *enduring* effects will be indirect, that is, its influence may be related to psychopathology through mediating factors (DeKlyen &

Greenberg, 2016). Precisely, this is the case of EDs (Tasca & Balfour, 2014) and depression (Mikulincer & Shaver, 2012; Morley & Moran, 2011). In this vein, an emerging line of research in this field focuses on the identification of the factors that may explain how insecure attachment could lead to such clinical symptoms (Brumariu & Kerns, 2010). The answer to this question will not only contribute to a better understanding of the role played by certain factors in the development and maintenance of EDs and depression, but will also provide empirical evidence for the formulation of new hypotheses in the light of existing theories.

The current thesis addresses the bidirectional prospective influence between insecure attachment and eating and depressive symptoms from middle childhood to adolescence, and whether such associations differ by gender. The work presented here is part of a broader longitudinal research study conducted with an initial sample of 954 Galician children who were followed biennially from age 10 to 16 across four waves of data collection. In particular, the present thesis compiles the results of three empirical studies and two meta-analyses. Study 1 focuses on the bidirectional prospective associations and temporal precedence between attachment relationships quality to different figures (i.e., mothers, fathers, peers). Study 2 explores the prospective associations between attachment relationships to mothers and fathers and depressive symptoms, with a special emphasis on the order of cause and effect, the impact of confounding factors, and gender-specific effects. Studies 3 and 4 are two meta-analyses that aim at identifying and measuring the effect size of the different pathways through which insecure attachment leads to eating psychopathology and depressive symptoms, respectively. Finally, Study 5 examines a mediational model in which insecure attachment, depressive and eating psychopathology are related, using a development, gender-sensitive approach and ruling out potential time-invariant confounders.

The next sections of the thesis provide a clearer picture of the issues under study. The second section contains a brief review of the relevant literature. The third section summarizes the aims of the thesis. The fourth section describes the methods used in the present

investigation. The fifth section includes the results of the five studies. Finally, the sixth and the seventh sections are devoted to a general discussion and the conclusions of the work carried out.

II. REVIEW OF THE LITERATURE

2. REVIEW OF THE LITERATURE

2.1. PROSPECTIVE ASSOCIATIONS BETWEEN INSECURE ATTACHMENT AND DISORDERED EATING FROM MIDDLE CHILDHOOD TO ADOLESCENCE

It is widely accepted that the combination of factors of diverse nature contributes to the development of eating psychopathology (Striegel-Moore & Bulik, 2007). Among these factors, it has been suggested the quality of attachment relationships, mainly with parents (e.g., Goossens et al., 2012) but also with friends, although to a lesser extent (Le Grange et al., 2014; Story et al., 2002). Insecurely attached individuals are characterized by a decrease in feelings of self-worth and an increase in the impression of being rejected by others. Such cognitions can make individuals more dependent on getting the acceptance of others and being more sensitive to societal standards (Cole-Detke & Kobak, 1996; Kenny & Hart, 1992). Consequently, adolescents with insecure attachment are more likely to internalize a particular aesthetic ideal according to the prevailing social canon, given that body image is a crucial aspect of social and emotional development at this stage (Voelker et al., 2015). In attempt to gain other's acceptance, insecurely attached individuals strive to reach that "ideal image", which in turn, puts them at risk of developing abnormal eating behaviors (Cole-Detke & Kobak, 1996). It has been even suggested that symptoms of anorexia and bulimia nervosa may function as a way to maintain the proximity to caregivers and to regulate negative affect, respectively (Armstrong & Roth, 1989; O'Kearney, 1996).

Unfortunately, prospective research assessing the association between insecure attachment and disordered eating among adolescents is very limited. For instance, Burge and colleagues (1997) found that the positive association between insecure attachment and eating disorder symptoms at late-adolescence increased the likelihood of developing an ED one year after among girls. Additionally, a study with female adolescents suggested that early infancy insecure attachment moderated the escalade between ED risk factors and ED

symptoms (Milan & Acker, 2014). Until now, only two studies have included both genders and have considered the effect of different attachment figures (i.e., mother, father, peers). Goossens and colleagues (2012) documented that in the pre-adolescent period insecure attachment (to mother and father) predicted a higher likelihood of eating disorder symptoms one year later. In contrast, another large prospective study with boys and girls found that higher scores with peer attachment, but not parental attachment, were associated with an increase in abnormal eating behaviors by mid-adolescence (Le Grange et al., 2014). Taken together, prospective evidence yielded inconclusive results regarding attachment figure and gender that need to be explored more precisely (Jewell et al., 2016).

2.1.1. Unidirectional versus bidirectional associations

Prior prospective studies have examined insecure attachment relationships as predictors of the later development of disordered eating without considering the reverse possibility. But, is it possible that child's disordered eating worsens the quality of attachment relationships with his/her parents and peers? Recently, there has been a conceptual shift in this regard so that a deterioration in the quality of interpersonal relationships might be an outcome, rather than a cause, of living with a child who has disordered eating (Nilsson et al., 2012; Sim et al., 2009). As previously mentioned, many researchers have questioned whether or not early attachment representations are malleable throughout the life course. Under the assumption that *IWMs* are open to considerable updates (e.g., Groh et al., 2014; Jones et al., 2018) and that the quality of close relationships with different attachment figures (i.e., father, mother, peers) may change in adolescence, it may be assumed that disordered eating worsens the quality of attachment relationships in the transition to adolescence. Yet, only two studies have explicitly explored the possibility that negative parent–child relationship could represent both cause and consequence of EDs symptoms. Crespo et al. (2010) pointed out that the bidirectional association between perception of family connection and body satisfaction among adolescents could be predicted over a year, but only for girls. Similarly, Korotana et al. (2018) tested the

longitudinal association between the quality of mother-daughter and father-daughter relationship and eating psychopathology, as well as the direction of their effects in a sample of 446 monozygotic twin girls. They showed that the parent-daughter relationship was more likely to predict subsequent eating symptoms across early adolescence, whereas eating pathology that develops in middle adolescence may negatively affect the parent-daughter relationship across later adolescence. Interestingly, the twin who reported greater eating pathology later on, declared more negative perceptions of the father-daughter relationship, as compared to her co-twin. This shortage of longitudinal studies indicates the need for more empirical research capable of elucidating the nature of the association between attachment relationships and disordered eating over time, testing both bidirectional effects. Also, taking into account the potential moderational effect that attachment figures and/or gender may have in these associations.

2.1.2. The influence of child's gender and attachment figure

It is important to consider that from middle childhood onwards social world expands. Authorities in the field of adolescent attachment research highlight the need to consider not only the dynamic nature of mental representations but also the different attachment relationships that develop throughout this period (Allen & Tan, 2016). As previously noted in the Introduction, in the transition to adolescence, children engage in the normative process of seeking autonomy from parents and greater decision-making authority (Kerns & Brumariu, 2016). Moreover, adolescents establish hierarchies of attachment that include persons other than their primary caregivers (Rosenthal & Kobak, 2010; Zeifman & Hazan, 2016). Thus, peers begin to enter *gradually* into this hierarchy and to increasingly take on critical attachment-related functions in terms of proximity-seeking and safe haven behaviors, especially in non-emergency situations (Zeifman & Hazan, 2016). For instance, when early adolescents face a variety of daily social and school related challenges, they will rather seek support from their peers as they might be more readily accessible and knowledgeable than their parents (Viejo et al., 2018). Henceforth,

attachment relationships, not only with parents, but also with peers become crucial and might exert a different and unique contribution to the psychosocial functioning of children, and in particular, an impact on eating behaviors. However, does the association between attachment to different figures and eating symptoms differ between boys and girls?

It is well known that subclinical manifestations of eating psychopathology are overrepresented in females (Croll et al., 2002; Striegel-Moore et al., 2009). In fact, it has consistently been shown that disordered eating escalates disproportionately in girls compared to boys, throughout the adolescent transition (Ferreiro et al., 2012; Holm-Denoma et al., 2014; Sancho et al., 2007). This gender difference might be explained by multiple risk factors (biological, psychological or sociocultural factors). During puberty, girls have to face diverse and dramatic physical changes in a short time (e.g., increases in the percentage of body fat, breast and hip size) that can lead to the perception of "getting fat" or "losing control" over their bodies instead of being aware that they are developing into a woman – sometimes even this concept can also be fearful if they feel unprepared (Wertheim & Paxton, 2011). On the contrary, for boys, the many changes associated with puberty are usually experienced as positive. While boy's body moves closer to the societal ideal shape for a man (Ricciardelli, 2012), girls often find themselves moving farther from societal ideals that portray thinness as beautiful and desirable (Wertheim & Paxton, 2011). Thus, girls are particularly sensitive to the views and comments of others; for instance, observations by their mothers about appearance or the need to control weight might increase unhealthy eating behaviors and body image concerns with long-term repercussions (Helfert & Warschburger, 2011; Kluck, 2010; Michael et al., 2014). Similarly, an adverse impact of the father's comments on their daughters' body shape and weight and eating behaviors have been found (Keery et al., 2005). On the contrary, boys tend to perceive the messages from their mothers regarding their bodies, shape and weight as less negative; although, fathers' comments on their sons' body shape can have a significant impact, either for better or worse (McCreary, 2012; Ricciardelli,

2012). In general, it seems that mothers mainly affect their daughters' unhealthy eating behaviors and fathers mainly influence their sons (Rodgers & Chabrol, 2009). Alongside parents, friends and peer' influences at this developmental stage can exert a positive effect on the self-image of adolescents, when they feel well connected and accepted (Holsen et al., 2012) but also a negative impact on their eating behaviors, when they compare their self-image to others or have conversations about appearance (Helfert & Warschburger, 2011).

Recapitulating up to here, few studies have addressed the possible influence of attachment on disordered eating, and the results so far are inconsistent. Moreover, there is no research about the reverse influence that disordered eating may have on the quality of attachment relationships. Thus, it remains unclear how attachment to the father, mother, and peers, as separate entities, can influence the development of disordered eating and/or *vice versa* throughout adolescence in boys and girls.

2.2. PROSPECTIVE ASSOCIATIONS BETWEEN INSECURE ATTACHMENT AND DEPRESSIVE SYMPTOMS FROM MIDDLE CHILDHOOD TO ADOLESCENCE

Wide research has identified insecure attachment as one of the main factors contributing to the etiology of depression (Bifulco et al., 2002; Davila et al., 2005; Morley & Moran, 2011). Attachment Theory asserts that children with inconsistent or unresponsive caregiving tend to develop maladaptive *IWMs* of self-criticism, abandonment and dependency (Bowlby, 1973). Not surprisingly, insecurely attached adolescents report deficits in social-behavioral and emotion regulation skills, a decreased level of self-worth and high levels of dysfunctional attitudes that increase their vulnerability to depression (Lee & Hankin, 2009; Rudolph, 2009). In consequence, numerous cross-sectional studies were carried out, but prospective research in adolescence is scarce. To the best of our knowledge, only six studies have examined the prospective association between insecure attachment and depressive symptoms in adolescents to date. In this regard, Sund & Wichstrom (2002), in a large sample of

adolescents 12–14 years of age assessed at two time points 1 year apart, found that attachment to parents was predictive of depressive symptoms one year later. Allen, Porter and McFarland (2007) examined over a three-year period a sample of 167 early adolescents (aged 13 to 15), and informed that insecure attachment (to fathers and peers) was linked to higher and stable patterns of depressive symptoms across adolescence. Moreover, two studies tested mediational models in which dysfunctional attitudes and low self-esteem (Lee & Hankin, 2009) and dependent interpersonal stressors (Cohen et al., 2013) explained the association between insecure attachment patterns and depressive symptoms. In addition, Brenning et al. (2013) with a sample of 289 high school students aged 12 years old found that that certain personality dimensions, in particular autonomy, affected attachment quality to the mother which in turn increased depressive symptoms. Taken together, these findings yielded inconclusive and limited results regarding attachment figure, gender and age.

2.2.1. Unidirectional versus bidirectional associations

As in the case of disordered eating, prior longitudinal studies on the link attachment-depression shared a common limitation: they were based on the assumption that an insecure attachment affects the later development of depressive symptomatology, without considering reverse or, even reciprocal, influences across time. Based on longitudinal evidence showing the limited continuity of attachment patterns from infancy to later adolescence or adulthood (Pinquart et al., 2013), changes of attachment quality are not only possible but common across life span (Aikins et al., 2009). Thus, can depressive symptoms erode of the quality of attachment relationships? It is indeed known that depressive symptoms have a detrimental impact on interpersonal relationships, especially with parents (Brière et al., 2013). According to the Interpersonal Theory of Depression (Coyne, 1999), there is a deleterious feedback loop between depressive symptoms and interpersonal relationships. Adolescent depressive behavior may elicit more negative, rejecting responses and less positive behavior from parents, which may result in lower parents-

offspring attachment quality (Hammen, 2006; Weinfield et al., 2004). In fact, recent studies have found that the perceived quality of parent-child relationships and depressive symptoms are prospective and reciprocally influenced among boys and girls (Boutelle et al., 2009; Branje et al., 2010). In answering our previous question, therefore, it is plausible that depressive symptoms could diminish the quality of attachment relationships; however, to date, and surprisingly, no study has provided support for reciprocal relations between attachment and depressive symptoms from middle childhood onwards. More prospective research is sorely needed to disentangle this possibility.

2.2.2. The influence of parental attachment figure and child's gender

Findings regarding the role of father and mother as attachment figures on the development of depressive symptoms are inconclusive, particularly across adolescence (Fox et al., 1991). For instance, while some research suggests that mothers are more likely than fathers to remain at the top of the attachment hierarchy (Doyle & Markiewicz, 2009; Markiewicz et al., 2006; Rosenthal & Kobak, 2010), others consider that mothers and fathers are equally important during adolescence (Kerns & Brumariu, 2016). Actually, in adolescence parents tend to adopt complementary roles: mothers represent the *safe haven* when children face distress and fathers represent their *secure base,* from which they feel supported to explore (Kerns et al., 2015). Concerning the attachment-depression link, the few studies that have analyzed the differential influence that the quality of attachment with the mother and the father has on depression, reported inconsistent results. Agerup et al. (2015) found that insecure attachment to both parents predicted the course of depressive disorders, but only attachment to mother predicted the change in status from not depressed to depressed in emerging adulthood. Duchesne and Ratelle's (2014) study reported that attachment to the mother consistently predicted different courses of depression whereas attachment to the father was only predictive of high and increasing depression during middle childhood and adolescence. Branje et al. (2010) indicated that whereas insecure attachment to the mother was a

predictor of future depression, at all time-points for boys and girls, insecure attachment to the father was only a predictor of depressive symptoms in boys.

Furthermore, effects of gender on attachment relationships in adolescence often suggest that females report more attachment security with mothers and fathers than males (Buist et al., 2002; Choi et al., 2012). Adolescent girls show an increasingly strong relational orientation and greater emotional needs than boys (Cyranowski et al., 2000; Rudolph, 2002), rendering them more vulnerable to interpersonal difficulties with parents. In addition, expectations of the social role of adolescents could also influence; that is, while females may tend to maintain close relationships with mothers, males may experience more expectations of becoming more autonomous and decrease the reliance on their mothers with age (Margolese et al., 2005). For these or related reasons, girls may report more secure attachment relationships with mothers and fathers than boys during adolescence (Ruhl et al., 2015). At the same time, stronger interpersonal orientation and emotional closeness to others could render girls more vulnerable to depression (Rudolph, 2009). Not only may the importance of attachment to parents for the development of depression differ for boys and girls, but also this differential impact may depend on the gender of the parent. This proposition has received preliminary support from studies finding poorer parent–adolescent relationship quality, especially with the mother, to predict later depressive symptoms in adolescent girls more strongly than in boys (Allen et al., 2007; Lewis et al., 2015). In contrast, it has been underscored that poor relationship quality to fathers predicts more depressive symptoms—but only among boys (Branje et al., 2010).

In sum, the current state of knowledge suggests that child's gender appears to moderate the effect of attachment on depressive symptoms. However, the evolution of depressive symptoms in boys and girls in relation to each attachment figure remains unexplored.

2.3. MEDIATING PROCESSES IN THE LINK BETWEEN INSECURE ATTACHMENT AND DISORDERED EATING AND DEPRESSIVE SYMPTOMS

As previously noted, research suggests that insecure attachment might function as an unspecific causal factor of psychopathology, therefore, it might be required the presence of different mechanisms that channel its impact on the development of psychopathology (DeKlyen & Greenberg, 2016). During the past two decades, there has been increasing interest in identifying which mechanisms are underlying the association between these early attachment experiences and eating and depressive psychopathology. In this regard, mediation analysis represents a useful analytic approach for exploring the extent to which an intermediate variable or mediator explains the effect of an independent variable on a dependent variable or outcome (e.g., Hayes, 2013; Lee et al., 2015; MacKinnon et al., 2002; Preacher & Hayes, 2004). Certainly, investigating paths between attachment and eating and depressive psychopathology can provide a fuller picture about the development of psychopathology in individuals with insecure attachment.

Regarding attachment-disordered eating link, studies hint towards the potential mediating role of emotional dysregulation, negative affect, maladaptive perfectionism and body dissatisfaction (Jewell et al., 2016; Tasca, 2018; Tasca & Balfour, 2014; Zachrisson & Skårderud, 2010). Concerning depressive symptoms, cognitive vulnerabilities (Brumariu & Kerns, 2010; Morley & Moran, 2011) and dysfunctional emotion regulation strategies (Malik et al., 2015) are the mediators that have received the most theoretical and empirical attention in explaining the pathways through which attachment leads to depression. Carefully designed longitudinal research would enable the detection of direct and mediated associations between attachment and later eating and depressive symptoms.

2.4. SUMMARY OF RESEARCH FINDINGS

This review of the literature reveals that there has been an escalation in research about the association between insecure attachment and the development of disordered eating and depressive symptoms in children and adolescents. However, there has been less

progress in questioning the nature of insecure attachment as a predictor of psychopathology, particularly among adolescents. Moreover, the majority of prospective studies were based on the assumption of the direct and unidirectional effect of attachment on eating and depressive symptoms. In consequence, research on insecure attachment in adolescence highlights the need to expand existing knowledge, considering: (a) the possibility that psychopathology may also erode the quality of attachment relationships (reverse effect), and (b) the mediating effects of different variables, taking into account the impact of potential confounders in these associations.

As noted above, the vast majority of studies have focused on mother-child attachment. Scarce attachment research has analyzed the differential importance of attachment figures (i.e., father, mother or peers) to the development of eating and depressive symptoms, despite the broad evidence about their importance for the psychosocial functioning of adolescents. Greater consideration is also needed of the moderating effect in these associations of adolescents' gender. The fact that depressive symptoms and disordered eating soar at increasingly early ages and manifest themselves in different ways by gender, invites to further clarify how the quality of attachment to different figures can differentially influence the development of eating and depressive symptoms in boys and girls.

Taking into account the state of the question, the present Doctoral Thesis aspires to give answers to the main questions that remain unsolved at the moment. To this end, this work examines from a developmental-gender perspective and following a longitudinal design, the reciprocal associations between attachment relationships (to the mother, father and peers) and eating and depressive psychopathology (subclinical level) in the transition from middle childhood to adolescence. Moreover, in order to know the main mediators that explain the association between quality of attachment and eating and depressive psychopathology, two different meta-analyses with their corresponding literature reviews will be conducted. Finally, an explanatory integrative model will be examined in which it will be tested whether depressive

symptomatology mediates the prospective association between insecure attachment and the development of eating symptomatology across this developmental stage in both boys and girls.

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III. AIMS OF THE THESIS

3. AIMS OF THE THESIS

The **overall aim** of the present Doctoral Thesis was to examine the prospective reciprocal association between the quality of attachment relationships (to the mother, father and peers) and disordered eating and depressive symptoms from middle childhood to adolescence, as well as to identify the mediating variables that are contributing to such associations and to ascertain how they interact. This general aim was operationalized through the following **specific aims**, grouped into five thematic blocks which were covered by each of the studies included in the thesis as indicated:

BLOCK I. Prospective associations between insecure attachment and disordered eating from middle childhood to adolescence (Study 1):

1. To explore the reciprocal associations between the quality of attachment relationships and disordered eating beyond the impact of preexisting symptomatology from middle childhood to adolescence.

2. To examine whether the bidirectional associations between attachment and disordered eating differ by attachment figure (i.e. mother, father, peers) or by child's gender.

BLOCK II. Prospective associations between insecure attachment and depressive symptoms from middle childhood to adolescence (Study 2):

3. To investigate the reciprocal associations between insecure attachment and depressive symptoms beyond the impact of preexisting symptomatology and potential time-invariant factors from middle childhood to adolescence.

4. To analyze whether the bidirectional relationships between depressive symptoms and disordered eating vary as a function

of the parents' and child's gender and of the developmental period.

BLOCK III. Mediators between insecure attachment and eating disorder symptoms: A systematic review and meta-analysis (Study 3):

5. To identify the main mediators through which insecure attachment confers vulnerability to the development of ED symptoms.

6. To quantify the size effect of each of the mediators.

BLOCK VI. Mediators between insecure attachment and depressive symptoms: A systematic review and meta-analysis (Study 4):

7. To identify the main mediators through which insecure attachment confers vulnerability to the development of depressive symptoms.

8. To quantify the size effect of each of the mediators.

BLOCK V. Mediating role of depressive symptoms linking insecure attachment and disordered eating in adolescents (Study 5):

9. To explore whether depressive symptoms constitute a pathway through which insecure attachment to both parents predicts subsequent development of disordered eating in the transition from middle childhood to adolescence, adjusting for initial levels of depression, disordered eating, attachment and all unmeasured time-invariant potential confounders.

10. To examine whether the effects differ by child's gender.

Table 1. Aims, justification and empirical studies included in the Doctoral Thesis

GENERAL AIM: to examine the prospective reciprocal association between the quality of attachment relationships (to the mother, father and peers) and depressive symptoms and disordered eating from middle childhood to adolescence, and identify the main mediating variables are contributing to such associations.	
SPECIFIC AIMS	**STUDIES**
1. To explore the reciprocal associations between the quality of attachment relationships and disordered eating from middle childhood to adolescence. 2. To examine whether these bidirectional associations differ depending on the attachment figure (mother, father, peers) or by child's gender *Rationale*: Limited and contradictory results on a) prospective reciprocal influences of insecure attachment relationships and eating symptoms across time, b) including different attachment figures and c) considering male samples.	**Study 1**: Prospective associations between insecure attachment and disordered eating from middle childhood to adolescence. *Reference*: **Cortés-García, L.,** Hoffmann, S., Warschburger, P., & Senra, C. (2019). Exploring reciprocal relationships between adolescent's perceptions of parental and peer attachment and disordered eating: A multiwave cross-lagged panel analysis. *International Journal of Eating Disorders*, 1-11. doi: 10.1002/eat.23086
3. To investigate the reciprocal associations between insecure attachment and depressive symptoms beyond the impact of preexisting symptomatology and potential time-invariant factors from middle childhood to adolescence. 4. To analyze whether these bidirectional relationships vary as a function of the parental and child's gender and of the developmental period. *Rationale*: Previous research a) was not able to report whether or not these associations remain after taking into account potential time-invariant confounders, b) did not consider the reverse influence and c) scarcely examined the differential importance of attachment to the mother and to the father and the gender of adolescent.	**Study 2**: Prospective associations between insecure attachment and depressive symptoms from middle childhood to adolescence. *Reference*: **Cortés-García, L.,** Wichstrøm, L., Viddal, K., & Senra, C. (2019). Prospective bidirectional associations between attachment and depressive symptoms from middle childhood to adolescence. *Journal of Youth and Adolescence,* 48, 2099-2113. doi: 10.1007/s10964-019-01081-4

Table 1. *(Continued)*

SPECIFIC OBJECTIVES	STUDIES
5. To identify the main mediators through which insecure attachment confers vulnerability to the development of ED symptoms. 6. To quantify the size effect of each of the mediators. *Rationale*: No study has systematically reviewed or measured the impact of these mediators to date.	**Study 3:** Mediators between insecure attachment and eating disorder symptoms: A systematic review and meta-analysis. *Reference*: **Cortés-García, L.,** Takkouche, B., Seoane, G., & Senra, C. (2019). Mediators linking insecure attachment to eating symptoms: A systematic review and meta-analysis. *PLoS ONE*, *14*(3). doi: 0.1371/journal.pone.0213099.
7. To identify the main mediators through which insecure attachment confers vulnerability to the development of depressive symptoms. 8. To quantify the size effect of each of the mediators. *Rationale*: No study has measured the impact of these mediators to date.	**Study 4:** Mediators between insecure attachment and depressive symptoms: A systematic review and meta-analysis. *Reference:* **Cortés-García, L.,** Rodriguez-Cano, R., Takkouche, B., Seoane, G., & Senra, C. (April, 2020). Insecure attachment style and depressive symptoms: A meta-analysis of mediators. Under review in *Journal of Affective Disorders*.
9. To explore whether depressive symptoms constitute a pathway through which insecure attachment to both parents predicts subsequent development of disordered eating in the transition from middle childhood to adolescence. 10. To examine whether the effects differ by child's gender. *Rationale*: No prior study examined the mediating effect of depressive symptoms in the link attachment-disordered eating prospectively and whether this model differs by attachment to the mother and father and by child's gender.	**Study 5**: Mediating role of depressive symptoms linking insecure attachment and disordered eating in adolescents. *Reference:* **Cortés-García, L.,** Wichstrøm, L., Viddal, K., & Senra, C. (September, 2019). The mediating role of depressive symptoms in the relationship between attachment insecurity and disordered eating across adolescence: A multiwave prospective study. Revised and resubmitted in *Development and Psychopathology*.

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IV. METHODS

4. METHODS

4.1. EMPIRICAL STUDIES

4.1.1. Participants

The current empirical studies are part of a larger project that investigates risk and protective factors for the development of diverse psychological problems in transition to adolescence (AP2008-01526, PSI2010-19793, PGIDIT05 CSO21101PR). Participants were recruited from different public and private schools, which were randomly selected as representative of coastal and inland areas in the province of A Coruña. A total of 15 schools were contacted and three out of them declined to participate. Enrollment was open to all pupils in grades 5–6 of primary schools. Figure 1 illustrates the participant flow from recruitment. A total of 954 children were invited to participate. At baseline (T1), the sample comprised 904 students (465 girls and 477 boys; M_{age} = 10.83; SD = 0.75). These adolescents were followed-up every two years across three additional waves: at Time 2 (T2) 880 adolescents (434 girls and 446 boys; M_{age} = 12.85; SD = 0.77), at Time 3 (T3) 738 participants (373 girls and 365 boys; M_{age} = 14.98; SD = 0.84), and at Time 4 (T4) 473 adolescents (244 girls and 229 boys; M_{age} =16.40; SD = 0.82) could be reassessed.

Regarding the characteristics of the sample at the study entry, the parents' educational level was as follows (based on the highest educational attainment by either parent): 68% primary education, 20% secondary education, and 12% higher education. The ethnic composition of the participants was 98% Caucasian, 1% Arab, and 1% "other", which is consistent with the relatively homogeneous ethnic breakdown of the population of reference (Instituto Galego de Estatística, 2017).

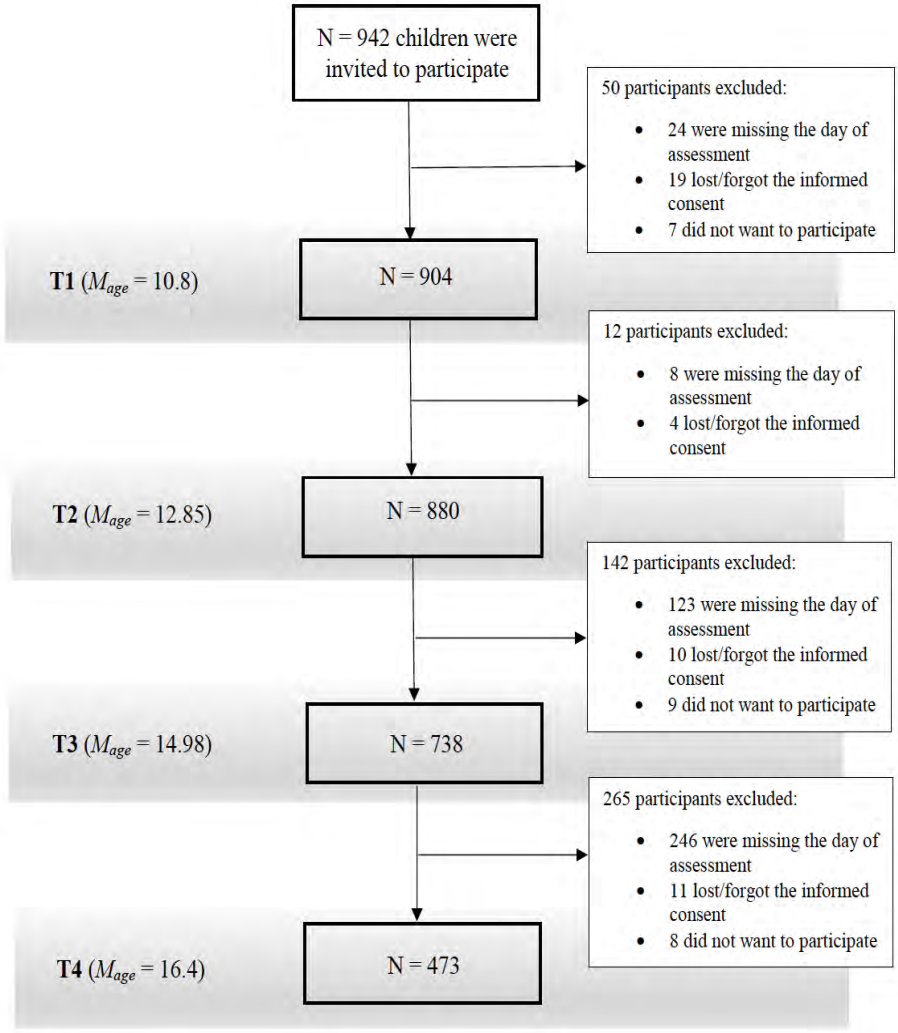

Figure 1. Flow chart of participant's recruitment

4.1.2. Measures

Children's Eating Attitudes Test (ChEAT; Maloney et al., 1988). The ChEAT is a 26-item self-report scale that assesses dysfunctional eating attitudes and behaviors among children and adolescents. Each item is rated on a 6-point scale ranging from 1 (always) to 6 (never) and scored from 0 to 3. Total sum scores range from 0 to 78. The Spanish version of the ChEAT used in this study has shown satisfactory internal consistency and concurrent validity (Senra et al., 2007). Items 9 ("I vomit after I have eaten") and 26 ("I have the urge to vomit after eating") were not administered at T1 because they were deemed unsuitable for the age group studied. These items were therefore not considered at the remaining time points to maximize measurement equivalence. In the present study, α coefficients ranged from .85 to .90 (see Appendix 2).

Children's Depression Inventory (CDI; Kovacs, 1992). The CDI is a 27-item self-report measure designed to evaluate depressive symptoms in children and adolescents. Each item has three response options that score 0 (absence of symptomatology), 1 (mild symptomatology), or 2 (severe symptomatology) (i.e., I am sad once in a while, I'm sad many times, I'm sad always). The Spanish version of the CDI used in this study has demonstrated adequate internal consistency, test–retest reliability, and concurrent and convergent validity (Del Barrio Gandara et al., 1999) Total scores range from 0 to 54. In the present sample, α coefficients ranged from .84 to .86 (see Appendix 2).

Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987). The IPPA-RV is a self-report questionnaire that separately assesses perceived quality of attachment towards mother, father, and peers in adolescents. Parents subscales comprise 25 items and peers's subscale 21 items, rated on a 5-point scale (from 1 = never to 5 = always). The overall score of attachment is obtained by summing responses of two subscales: degree of Mutual trust (e.g., "My mother me as I am") and Quality of communication (e.g., "I like to get my mother's point of view on things I am concerned about"),

and by subtracting the score of the subscale of anger and alienation (e.g., "I feel angry with my mother"). Higher scores on Trust and Communication and lower score on Alienation indicate higher attachment security. The Spanish-language version of the IPPA (Pardo et al., 2006) used in this study has shown satisfactory internal consistency and concurrent validity. In our sample, α coefficients ranged from .72 to .95 (see Appendix 2).

4.1.3. Procedure

This research received approval from the Bioethics Committee of the University of Santiago de Compostela and the Regional Government of Galicia (see Appendix 3). Permission to carry out the study was obtained from the head teachers of all schools (see Appendix 4). Informed consent was obtained from the parents of the students that participated at a voluntary basis (see Appendix 5). Participants were rewarded by inclusion in a prize draw for five laptops and four tablet computers after T3 and T4, respectively. The data were collected in school classes with 20–25 students. All participants were informed that the purpose of the research was to explore a variety of protective and risk behaviors associated with youth wellbeing and they were given standard instructions for filling out the questionnaires. Two trained research assistants remained in the classroom throughout the study session in order to answer any questions and prevent communication among the students. In case of missing the scheduled data assessment (e.g., illness, truancy), the students were rescheduled for later evaluation in a short time. Students missing the first assessment in the classroom for various reasons (e.g., illness, truancy, and travel) were rescheduled for later evaluation in a few weeks' time.

4.1.4. Statistical analyses

Drop-out and descriptive analyses were carried out using IBM SPSS Statistics 24. Structural equation modeling (SEM) was applied using Mplus 7 in Study 1 and Mplus 8.1 (Muthén & Muthén, 1998–2018) in Studies 2 and 5. Missing data were handled using full information maximum likelihood estimation (FIML).

4.1.4.1. Study 1

Three different models testing the reciprocal relationships between disordered eating and attachment to father, mother and peers were analyzed separately for each attachment figure. Moreover, correlational and regressive paths were estimated separately for boys and girls to examine gender differences. First, Chi-square difference test was used to examine the moderator effect of gender for the overall models. Second, Wald test was used to identify differences in individual regression coefficients. The following model fit indices were classified acceptable: root mean squared error of approximation (RMSEA) ≤ .08, comparative fit index (CF) ≥ .95, Tucker-Lewis index (TLI) ≥ .95, and standardized root mean residual (SRMR) ≤ .10 (Schermelleh-Engel et al., 2003). Modification indices were considered to improve model fit by the specification of further paths.

4.1.4.2. Study 2

First, a traditional autoregressive cross-lagged model was applied to address the question on whether insecure attachment relationships predicted more depressive symptoms, and *vice versa*, over and above earlier depressive symptoms. Residuals in depression and attachment at each time point were allowed to correlate. Next, a Dynamic Panel Model (DPM) was created to rule out all unmeasured time-invariant confounders. Three different models were tested. A *fixed effects* DPM implies that the effects of time-varying predictors (e.g., attachment) are adjusted for the confounding effect of unmeasured time-invariant factors, but only utilizing within-person variation, i.e., participants serve as their own control. A *random effects* DPM uses both within- and between-person information and thus has more statistical power than a fixed effects model. However, predictors are assumed to be uncorrelated with the time-invariant factor(s) in a random effects model. A *hybrid model* allows keeping both fixed and random effects (Firebaugh et al., 2013). That is, some predictors are set to correlate with the time-invariant factor(s), whereas other predictors are not. A hybrid model retains the fixed effects advantage of adjusting for time-invariant factors (when these may influence the results) while being more parsimonious and more statistically powerful that a pure fixed

effects model (Allison, 2009; Bollen & Brand, 2010; Firebaugh et al., 2013). The Satorra-Bentler scaled $\Delta\chi 2$ test (Satorra, 2000), which is a functional equivalent to the Hausman test (Hausman, 1978), was used to decide which model arrive at the best-fitting model. Importantly, if the hybrid model does not deteriorate fit, this model would be preferred for power and parsimonious reasons.

4.1.4.3. Study 5

The impact of attachment on eating problems via depression was tested using a Dynamic Panel Model (DPM) approach within a structural equation framework (Allison et al., 2017; Bollen & Brand, 2010; Wichstrøm et al., 2017). In the autoregressive cross-lagged part, attachment, disordered eating, and depressive symptoms measured during the last three waves of data collection were regressed on these symptoms two years earlier. The error terms of all predictors were allowed to correlate at each time point. The time-invariant factor part consisted of three latent factors loading on the three constructs at the last three time-points, while being correlated with all initial values, which were considered exogenous. Further, and similar to Study 2, three different DPM were run. To test whether a hybrid model does not deteriorate fit, the Satorra-Bentler scaled chi-square test (Satorra, 2000) was used to compare it to a fixed effects model.

To investigate mediation, the model was adjusted for all relevant direct effects, e.g. when examining the potential effect of insecure attachment at age 10 on eating problems at age 16 via depression at age 12 and/or 14, it was adjusted for the direct effects of depressive symptoms and attachment at age 12 as well as the direct effect of age-10 attachment. Bootstrapped asymmetric confidence intervals with 1000 draws were applied.

4.2. META-ANALYSES

The protocol for both reviews and meta-analyses were registered with the PROSPERO international prospective register of systematic reviews (CRD42017079626 and CRD42017076807). Both reviews were reported in accordance with the PRISMA statement (Moher et al., 2009) (see Appendix 6).

4.2.1. Search strategy

Comprehensive systematic searches were performed on the following databases: *Medline, Pubmed, PsycINFO and EMBASE.* Additionally, Conference Proceedings Citation Index- Science (CPCI-S) and Social Science & Humanities (CPCI-SSH) and ProQuest Dissertations & Theses Global were searched. Reference lists of included studies were scanned for any additional relevant studies. For each study, two search strategies with precise keywords were set: 1): [(attachment style OR attach* OR attachment) AND (eating disorder* OR eating symptom* OR eating psycho* OR "disordered eating") AND (mediat* OR indirect OR "structural equation modeling" OR "structural equation modelling" OR "SEM" OR (Baron AND Kenny) OR Mackinnon OR "product of coefficient" OR "difference in coefficient" OR sobel OR "causal pathway" OR intermediate OR "indirect effect" OR mechanism)] and 2) [ab(attachment) AND ab (depress* OR "depression" OR depressive disorder* OR depressive symptom*) AND ab (mediat* OR indirect OR "structural equation modeling" OR "structural equation modelling" OR "SEM" OR "path" OR (Baron AND Kenny) OR "MacKinnon" OR "product of coefficient" OR "difference in coefficient" OR "sobel" OR "causal pathway" OR "intermediate" OR "indirect effect" OR "mechanism")].

4.2.2. Inclusion/exclusion criteria

The following inclusion criteria were adhered to in all studies: (1) be published prior to January 2019 and May 2019 in the case of EDs and depression, respectively; (2) only empirical studies reporting on the effect of mediating mechanisms linking attachment style (towards father, mother and peers or romantic partner) and eating or depressive symptoms; (3) studies that conducted a mediation analysis (e.g. Baron and Kenny's causal steps of mediation, structural equation modelling) or significance tests of mediation (e.g. Sobel test, Bootstrapping); (4) studies carried out with participants at any age from clinical (by criteria DSM-IV, DSM-IV-TR, or DSM-5) and subclinical samples (individuals exceeding the clinical cut-off of depression/EDs measures or reporting eating/depressive symptoms that place them at

risk); and (5) only articles written in English, Spanish, German or French were included.

Patients with other significant diseases or mental disorders were excluded. Papers exploring attachment as a mediator were not considered since the focus of our study is to understand attachment as an independent. Other reviews and meta-analyses were also excluded.

4.2.3. Study selection

Preliminary screening of the studies obtained by the systematic search in relation to the inclusion and exclusion criteria was performed by the main author. Co-authors reviewed all titles and abstracts, excluded studies that did not address mediational analysis, and independently examined each full article to determine final inclusion or exclusion. Reasons for exclusion of full texts were recorded and documented in a PRISMA flow diagram. Discordances on inclusion or exclusion of articles were analyzed, and disagreements were resolved via consensus. A data extraction template including all eligible studies with key items based on a year of publication, country, recruited population, sample size, methods to assess attachment, mediating variables and eating symptomatology and main results was designed.

4.2.4. Data extraction

In both studies, data were extracted by two reviewers independently using a form that was specifically developed for the reviews. The extracted data were further verified independently by a third reviewer. Extraction data included author, year and country of publication, research aims, setting and design, sample characteristics, measures used for the independent, mediating and dependent variables, specific mediator(s), method of mediation analysis and standardized regression coefficients for the different paths (direct, indirect and total effects). In case of any disagreements between the reviewers regarding the extracted data, they were resolved by consensus, by reviewing again the study or by contacting directly the original author. An email request was also sent to the authors (in some

cases up to three emails) in order to obtain any unpublished data necessary to perform the meta-analysis.

4.2.5. Data synthesis analysis

Comprehensive Meta-Analysis (CMA) was used to conduct all analyses. First, the overall effect size of the mediators among all studies was calculated, and second it was compared whether the effect sizes differed according to the type of sample (*clinical vs. non-clinical*), attachment type (*anxious vs. avoidant*), gender (*female vs. male*), age (*children/adolescents vs. adults*), and quality (*low vs. high*). Before pooling, the data was categorized by type of sample (clinical and non-clinical) in study 3 and by age of participants (children/adolescents and adults) in study 4 and classified all mediators by construct in both studies. Subgroup analysis by mediators was only carried out when more than 2 studies were available for each mediator. For each analysis, it was used the standardized regression coefficients (β) or, failing that, r (Pearson correlation coefficient) (Peterson & Brown, 2005), and sample sizes to calculate a pooled effect size for the indirect ($a*b$) and total effects (path c) (Hayes & Rockwood, 2017). In cases where studies presented their results under the form of unstandardized regression coefficient, the β ($\beta = B*[Sx/Sy]$) was calculated (Bring, 1994). To provide a summary of each mediation model, in both studies, the mediation ratio (Ditlevsen et al., 2005) of the pooled indirect effect and the pooled total effect ($PM = (a*b/c)$ was calculated (Shrout & Bolger, 2002). Heterogeneity was assessed using the I^2 statistic and we assigned thresholds of 25%, 50%, and 75% to signify low, moderate, and high heterogeneity, respectively. Both fixed-effects and random-effects pooled estimates were calculated but only the latter was presented when heterogeneity was above moderate (>50%).

Publication bias was also assessed visually through funnel plots in Study 3 and formal testing using Egger's test in Studies 3 and 4 (Egger et al., 1997). Sensitivity analyses were also performed, recalculating the pooled estimates under extreme conditions.

4.2.6. Quality rating

Eligible papers were evaluated for methodological quality with the critical appraisal tool originally developed by Lee et al. (2015), but further adapted by Cortés-García et al. (2019) for the purpose of the present studies (see Appendix 7). Each study was independently rated providing a score of 1 (yes) or 0 (no) to the 10 items. Studies were categorized into weak (scoring 0-3), moderate (scoring 4-6), and strong (scoring 7-9) on the basis of these criteria. Disagreements between reviewers were resolved by discussion. Furthermore, a pooled analysis comparing low quality studies (scores < 5) with moderate-high quality studies (scores = > 5) was carried out.

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V. RESULTS

5. RESULTS

5.1. STUDY 1. EXPLORING THE RECIPROCAL RELATIONSHIPS BETWEEN ADOLESCENTS' PERCEPTIONS OF PARENTAL AND PEER ATTACHMENT AND DISORDERED EATING: A MULTIWAVE CROSS-LAGGED PANEL ANALYSIS

Attrition Analyses

A total of 904 participants were included at baseline and self-report data were available for 97.3%, 81.6% and 52.3% of adolescents at T2, T3 and T4, respectively. It should be noted that attrition is highly frequent in long-term longitudinal studies and usually ranges from 30 to 70 % (Gustavson et al., 2012). In the present study, higher attrition at T4 might be explained by the fact that, by that time, many students had completed compulsory education and had, therefore, left school. There were no significant differences between participants who had available data at all four time points and those who missed one or more time points on any baseline clinical or demographic variable except age (t = 9.26, p < .001; M_{age} missing = 11.06, M_{age} participating = 10.61) and attachment to peers (t = -2.83, p < .01; M_{att} missing = 8.83, M_{att} participating = 6.06). At T4, logistic regression analyses showed that attrition was higher among children reporting lower quality attachment towards mother, father and peers at T1 (OR = 0.88, CI: 0.79, 0.98; OR = 1.11, CI: 1.01, 1.22; OR = 1.19, CI: 1.05, 1.35; respectively) and more eating symptoms at T1, T2 and T3 (OR = 0.97, CI: 0.95, 0.99; OR = 0.98, CI: 0.97, 0.99; OR = 0.98, CI: .96, 0.99, respectively). Attrition was also higher at T3 among those reporting more eating symptoms and less attachment to the father at T2 (OR = 0.98, CI: 0.95, .99; OR = 1.12, CI: 1.00, 1.24, respectively).

Descriptive statistics

Table 2 shows means and standard deviations for the analyzed variables at each measurement time for the total sample and by gender, and the results of t tests comparing girls and boys. Regarding disordered eating, girls scored higher than boys at T2, T3, and T4 and gender differences arose between T1 and T2 (i.e., approximately

between ages 10-11 and 12-13). Girls scored significantly higher than boys on attachment towards mother at T2 (ages 12-13), T3 (ages 14-15) and T4 (ages 16-17). No gender differences were found regarding attachment toward father at any time, whereas significant gender differences emerged regarding attachment toward peers across the age range. Girls scored higher than boys at all measurement points.

Table 2. Descriptive statistics and gender differences in the study variables

	Total sample			Girls			Boys			
	n	Mean	SD	n	Mean	SD	n	Mean	SD	*t*
ChEAT										
T1	890	17.49	7.40	440	17.19	7.45	450	17.79	7.35	-1.21
T2	880	11.43	9.02	434	12.24	9.04	446	10.65	8.95	2.64**
T3	738	10.05	9.08	373	12.72	10.17	365	7.32	6.82	8.49***
T4	473	9.77	9.28	244	13.13	10.37	229	6.19	6.21	8.89***
IPPA										
Mother										
T1	882	6.39	1.81	434	6.46	1.85	448	6.32	1.77	1.16
T2	863	6.19	1.81	424	6.36	1.87	439	6.02	1.74	2.72**
T3	729	5.76	1.83	371	5.97	1.95	358	5.55	1.68	3.11**
T4	464	5.71	1.79	241	5.91	2.00	223	5.49	1.51	2.56*
Father										
T1	870	5.74	1.88	430	5.77	1.91	440	5.72	1.84	0.45
T2	851	5.49	1.87	421	5.48	2.03	430	5.50	1.70	-0.14
T3	707	5.07	1.71	355	5.12	1.79	352	5.02	1.63	0.79
T4	455	5.09	1.80	231	5.19	1.97	224	4.98	1.61	1.24
Peers										
T1	892	5.94	1.24	440	6.31	1.08	452	5.59	1.27	9.19***
T2	876	6.07	1.39	432	6.49	1.32	444	5.67	1.34	9.22***
T3	737	6.19	1.25	373	6.59	1.18	364	5.77	1.19	9.43***
T4	469	6.14	1.15	241	6.34	1.18	228	5.93	1.09	3.86***

Note. ChEAT = Children's Eating Attitudes Test; T1 (10 years-old); T2 (12 years-old); T3 (14 years-old); T4 (16 years-old); IPPA = Inventory of Parental and Peers Attachment. $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Prospective associations between attachment to mother and disordered eating

Figure 2 shows that the model including the autoregressive path between attachment to mother at T2 and attachment to mother at T4, indicated by the modification indices, fits the data well: RMSEA = .075, CFI = .984, TLI = .961, SRMR = .036. All autoregressive paths reached statistical significance in both genders. Disordered eating (T2–T3) and attachment (T3–T4, T2–T3) showed higher stability in girls compared to boys (see Table 3). Concerning the cross-lagged paths, poorer attachment at T1 and T2 was associated with more eating disorder symptoms at T2 and T3, respectively. Moreover, there was a negative influence between poorer attachment at T3 and more disordered eating at T4 in girls only. Gender comparisons indicated that all these cross-lagged influences were more pronounced in girls compared to boys. Although the regressive path between disordered eating (T3) and attachment to mother (T4) reached significance in girls as well, the comparison of the non-standardized coefficients, t = 1.04, $p < .001$, indicated a stronger effect from attachment to disordered eating than in the opposite direction.

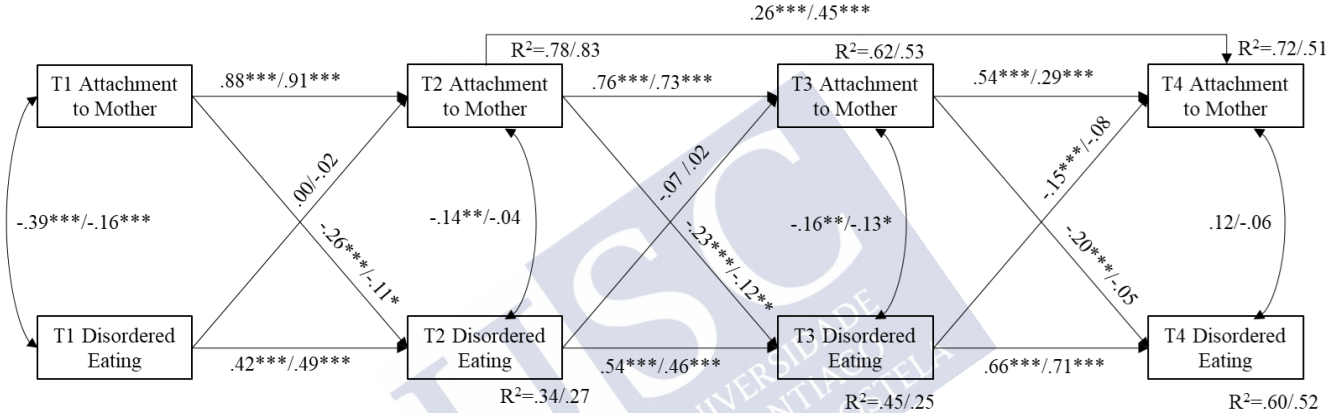

Figure 2. Cross-lagged panel model examining the association between disordered eating and attachment to the mother.
Note. Standardized coefficients are depicted. Results for girls are named first, results for boys are named second. RMSEA = 0.075, CFI = 0.984, TLI = 0.961, SRMR = 0.036. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table 3. Gender differences

Path	Girls	Boys	Difference
Gender differences in regression coefficients regarding the model on disordered eating and attachment to the mother			
T3 Disordered Eating on T2 Disordered Eating	.62 (.05)	.36 (.04)	.26 (.06), p < .001
T4 Attachment to Mother on T3 Attachment to Mother	.55 (.06)	.27 (.07)	.27 (.09), p < .01
T3 Attachment to Mother on T2 Attachment to Mother	.81 (.04)	.70 (.04)	.11 (.05), p < .05
T4 Disordered Eating on T3 Attachment to Mother	-1.07 (.25)	-.19 (.20)	-.88 (.32), p < .01
T3 Disordered Eating on T2 Attachment to Mother	-1.28 (.24)	-.48 (.18)	-.80 (.30), p < .01
T2 Disordered Eating on T1 Attachment to Mother	-1.28 (.21)	-.53 (.21)	-.75 (.30), p < .05
Gender differences in regression coefficients regarding the model on disordered eating and attachment to the father			
T3 Disordered Eating on T2 Disordered Eating	.72 (.05)	.38 (.04)	.35 (.06), p < .001
T2 Disordered Eating on T1 Attachment to Father	-.54 (.20)	.06 (.20)	-.60 (.28), p < .05
Gender differences in regression coefficients regarding the model on disordered eating and attachment to peers			
T3 Disordered Eating on T2 Disordered Eating	.72 (.05)	.38 (.04)	.34 (.06), p < .001
T2 Attachment to Peers on T1 Attachment to Peers	.96 (.04)	.84 (.03)	.12 (.05), p < .05

Note. T1 = Age 10; T2 = Age 12; T3 = Age 14; T4 = Age 16

Prospective associations between attachment to father and disordered eating

The inclusion of the autoregressive path between attachment to father at T2 and attachment to father at T4 fit the data well: RMSEA = .076, CFI = .979, TLI = .948, SRMR = .038, the adjusted model fits the data. The chi-square difference test revealed that gender moderated the regressive paths within the model, $\Delta\chi 2 = 52.13$, $df = 13$, $p < .001$. All autoregressive paths reached statistical significance in both genders (see Figure 3). Stabilities were comparable between genders, with the exception of disordered eating (T2–T3) (Table 3). In girls, poorer attachment to the father at T1 was associated with more eating disorder symptoms at T2. In boys, this path did not reach significance and the comparison of the regression coefficients revealed a stronger influence in girls compared to boys. Disordered eating at T1 predicted more attachment to father at T2 in boys only. However, the regression coefficient was relatively low and was not statistically different between girls and boys, $t = 0.02$, $p = .099$.

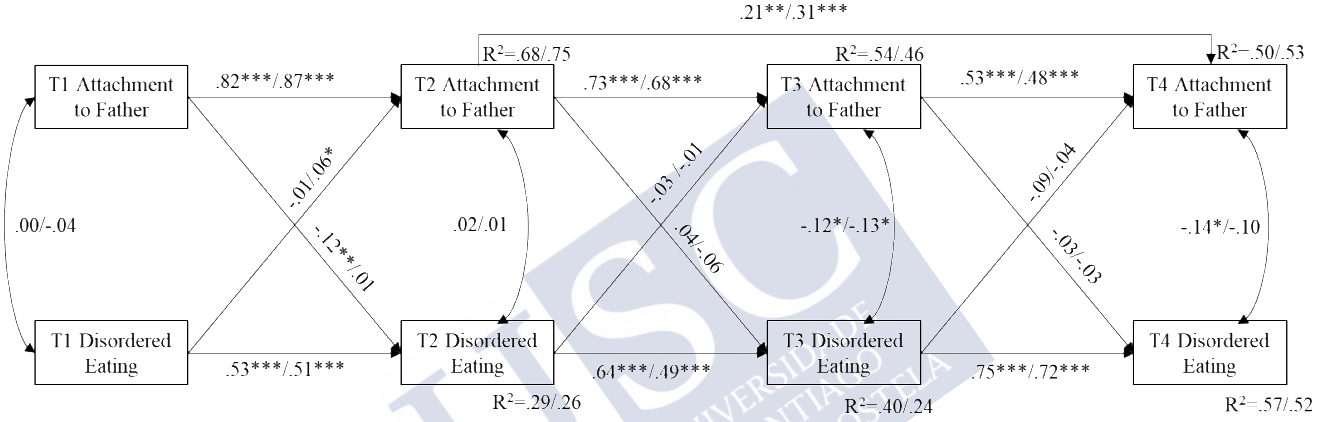

Figure 3. Cross-lagged panel model examining the association between disordered eating and attachment to the father.
Note. Standardized coefficients are depicted. Results for girls are named first, results for boys are named second. RMSEA = 0.076, CFI = 0.979, TLI = 0.948, SRMR = 0.038. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. *** p < 0.001, ** p < 0.01, * p < 0.05.

Prospective associations between attachment to peers and disordered eating

The model including the autoregressive path between attachment to peers at T2 and attachment to peers at T4 fits the data well: RMSEA = .058, CFI = .984, TLI = .962, SRMR = .038. Gender moderated the regressive paths, $\Delta\chi 2 = 49.44$, df = 13, $p < .001$. All autoregressive paths reached statistical significance in both genders (Figure 4). With the exception of disordered eating (T2–T3) and attachment to peers (T1-T2), stabilities were similar between genders (Table 3). Regarding the cross-lagged paths, better attachment relationships with peers at T1 was associated with more eating disorder symptoms at T2, but only in boys. The regression coefficient was comparably low and there was no gender difference, $t = 0.58$, $p = .197$.

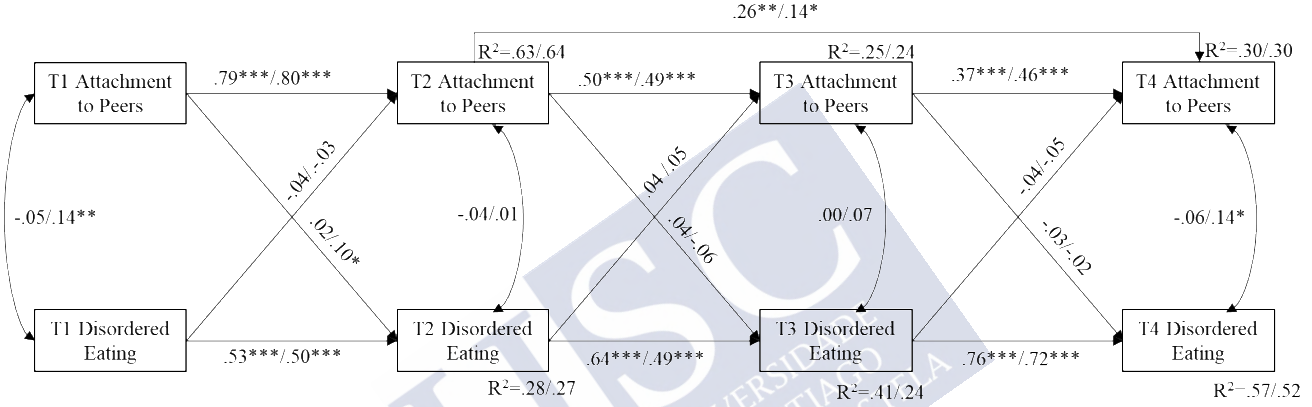

Figure 4. Cross-lagged panel model examining the association between disordered eating and attachment to peers.
Note. Standardized coefficients are depicted. Results for girls are named first, results for boys are named second. RMSEA = 0.058, CFI = 0.984, TLI = 0.962, SRMR = 0.038. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

5.2. STUDY 2. PROSPECTIVE BIDIRECTIONAL ASSOCIATIONS BETWEEN ATTACHMENT AND DEPRESSIVE SYMPTOMS FROM MIDDLE CHILDHOOD TO ADOLESCENCE

Descriptive Analyses

Table 4 displays means, standard deviations, and correlations between all observed variables. In short, attachment to mother and father were negatively correlated with later depression at all-time points, for both boys and girls.

Table 4. Descriptive statistics and bivariate correlations in the study variables (N = 904)

Variables	Mean (*SD*) Girls *n* = 447	Boys *n* = 457	1	2	3	4	5	6	7	8	9	10	11	12
1. T1 Depressive symptoms	10.14 (6.09)	10.16 (6.31)	–	0.57***	0.39***	0.43***	-0.45***	-0.41***	-0.34***	-0.36***	-0.12*	-0.23***	-0.26***	-0.17**
2. T2 Depressive symptoms	11.02 (6.06)	10.58 (6.69)	0.54***	–	0.57***	0.52***	-0.58***	-0.55***	-0.46***	-0.49***	-0.31***	-0.40***	-0.38***	-0.32***
3. T3 Depressive symptoms	12.54 (6.19)	10.17 (5.71)	0.43***	0.50***	–	0.74***	-0.47***	-0.48***	-0.52***	-0.61***	-0.15***	-0.18***	-0.32***	-0.30***
4. T4 Depressive symptoms	13.54 (6.19)	9.84 (5.16)	0.45***	0.47***	0.63***	–	-0.43***	-0.44***	-0.50***	-0.61***	-0.08	-0.16**	-0.23***	-0.38***
5. T1 Attachment mother	6.46 (1.85)	6.32 (1.77)	-0.41***	-0.51***	-0.45***	-0.42***	–	0.88***	0.71***	0.71***	0.54***	0.53***	0.47***	0.48***
6. T2 Attachment mother	6.36 (1.87)	6.02 (1.74)	-0.40***	-0.50***	-0.40***	-0.43***	0.91***	–	0.78***	0.77***	0.49***	0.51***	0.43***	0.43***
7. T3 Attachment mother	5.97 (1.95)	5.55 (1.68)	-0.35***	-0.45***	-0.47***	-0.42***	0.72***	0.73***	–	0.83***	0.38***	0.41***	0.56***	0.52***
8. T4 Attachment mother	5.91 (2.00)	5.49 (1.51)	-0.30***	-0.39***	-0.44***	-0.40***	0.67***	0.67***	0.63***	–	0.35***	0.38***	0.46***	0.61***
9. T1 Attachment father	5.77 (1.91)	5.72 (1.84)	-0.23***	-0.29***	-0.24***	-0.11	0.61***	0.58***	0.52***	0.47***	–	0.83***	0.55***	0.55***
10. T2 Attachment father	5.48 (2.03)	5.50 (1.70)	-0.18***	-0.28***	-0.18***	-0.08	0.53***	0.52***	0.46***	0.44***	0.87***	–	0.70***	0.58***
11. T3 Attachment father	5.12 (1.79)	5.02 (1.63)	-0.17**	-0.25***	-0.34***	-0.14*	0.48***	0.43***	0.62***	0.49***	0.68***	0.67***	–	0.68***
12. T4 Attachment father	5.19 (1.97)	4.98 (1.61)	-0.08	-0.15*	-0.22***	-0.15*	0.41***	0.37***	0.45***	0.63***	0.53***	0.58***	0.65***	–

Note. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. Correlations for girls are represented in shadowed area and for boys are represented in white area.
*$p < .05$ ** $p < 0.01$ *** $p < 0.001$

Reciprocal Associations between Attachment and Depressive Symptoms

The autoregressive cross-lagged model revealed moderate to high stability in attachment as well as depression (Figure 5). Regarding the cross-lagged paths, better mother-child attachment at T1 predicted fewer depressive symptoms at T2 and a similar influence was obtained from T2 to T3. Depressive symptoms at T2 predicted diminished mother-child attachment quality at T3, and similarly, depressive symptoms at T3 predicted poorer attachment at T4. In contrast, only one (unexpected) cross-lagged path involving fathers emerged: better father-child attachment at T2 predicted more depressive symptoms at T3.

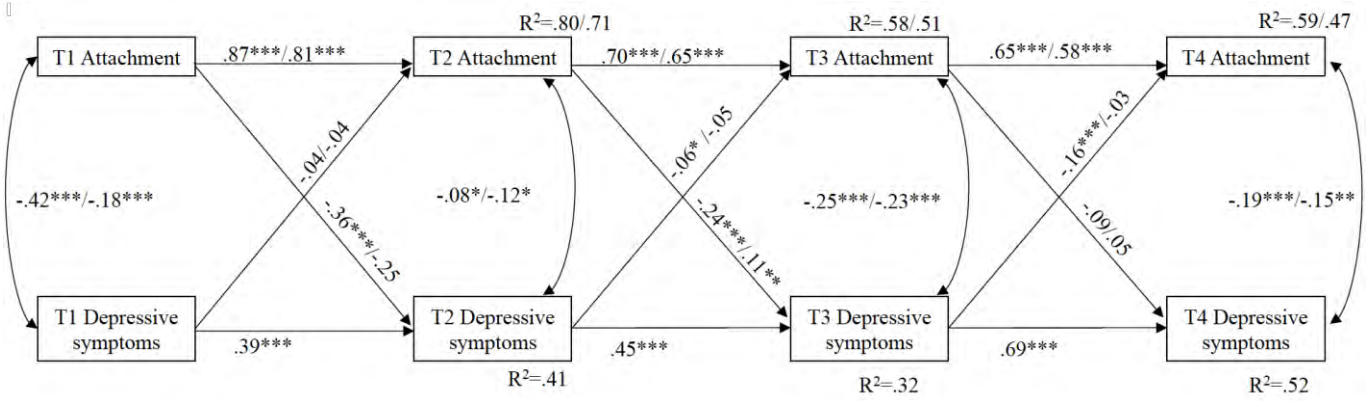

Figure 5. Cross-lagged panel model examining the association between depressive symptoms and attachment for full sample.
Note. Standardized coefficients are depicted. Results for attachment to mother are named first, results for attachment to father are named second. RMSEA = 0.065, CFI = 0.973, TLI = 0.938, SRMR = 0.043. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Adjusting for all Time-invariant Confounders

Three different models were tested, a random effects model, that presupposes that the initial values (age 10) are uncorrelated with the latent time-invariant factors, fitted the data reasonably well (Table 5; M2) (Allison, 2009). A fixed effects model, which presupposes the initial values can be correlated with the latent time-invariant factors, fitted the data better (M3). In this model, the time-invariant depression factor was uncorrelated with age-10 attachment to father (β = -.05, p = .79), and age-10 depression was similarly uncorrelated with the time-invariant attachment-to-father measure (β = -.13, p = .17), and these two time-invariant factors were unrelated (β = .07, p = .83). Fixing these parameters to 0 resulted in a hybrid model (M4), which fitted the data no worse than the fixed effects model and was thus preferred for parsimonious and power reasons.

Table 5. Results of model fitting procedure

	X^2	*df*	*p*	ΔX^2	*df*	*p*	RMSEA[a] (90% CI)	SRMR[b]	CFI[c]	TLI[d]
M1: Baseline model	3974.38	63	<.001							
M2: Time-invariant random effects	94.65	21	<.001				.062 (.050, .075)	.026	.981	.944
M3: Time-invariant fixed effects	12.69	12	.39	122.60	9	<.001	.008 (.000, .035)	.008	1.000	.999
M4: Time-invariant hybrid model	**18.51**	**15**	**.24**	**6.25**	**3**	**.10**	**.028 (.000, .037)**	**.015**	**.999**	**.996**

Note. $\Delta\chi^2$ is corrected according to Satorra-Bentler's procedure. Preferred model in bold. [a] Root mean square error of approximation; [b] Standardized root mean square residual; [c] Comparative fit index; [d] Tucker Lewis Index. Letters in bold indicate the hybrid model preferred for the study.

The results from this hybrid model shows: All autoregressive paths reached statistical significance. Cross-lagged paths indicated that better mother-child attachment predicted fewer depressive symptoms two years later, from T1 to T2 and from T2 to T3. Moreover, better father-child attachment at T1 also predicted fewer depressive symptoms at T2. Conversely, more depressive symptoms at T1 predicted poorer father-child attachment at T2. Similarly, depressive symptoms reduced the quality of attachment to mothers from T2 to T3 and from T3 to T4 (Figure 6).

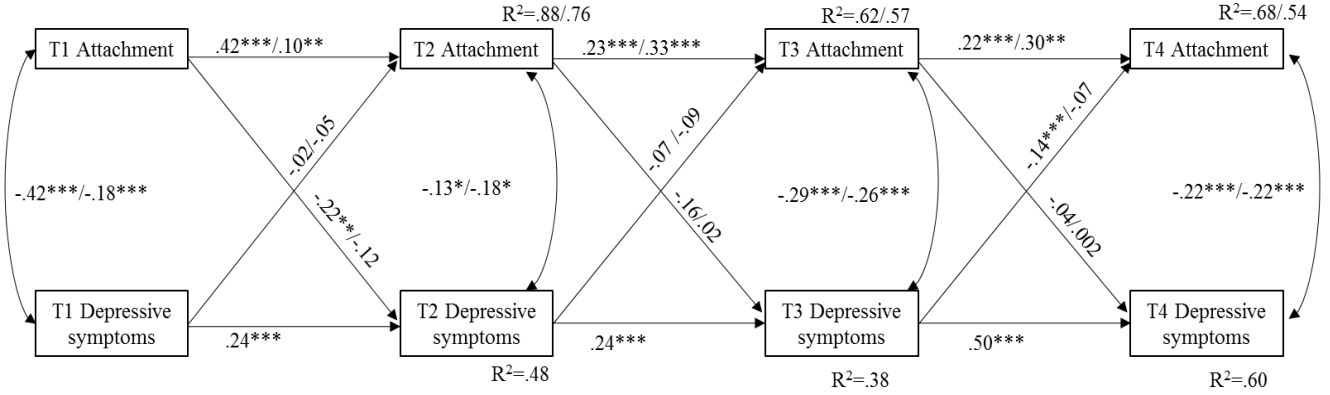

Figure 6. Cross-lagged dual path model fixed examining the association between depressive symptoms and attachment for full sample. *Note.* Standardized coefficients are depicted. Results for attachment to mother are named first, results for attachment to father are named second. RMSEA = 0.008, CFI = 1.000, TLI = 0.999, SRMR = 0.008. T1/T2/ T3/T4 = Time 1/Time 2/Time 3/Time 4. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Differential Importance from and on Mother-child and Father-child Attachment

Figure 7 shows that the influence of attachment to mothers was stronger than attachment to fathers' vis-à-vis later depressive symptoms. Thus, whereas better mother-child attachment quality predicted fewer depressive symptoms from T1 to T2 and from T2 to T3, only father-child attachment at T1 predicted fewer depressive symptoms at T2. To test whether these differential effects were indeed significant, a model where the effects to mothers and fathers were freely estimated was compared to a model where they were fixed to be identical, using Satorra's procedure (Satorra, 2000), examining one path at a time (Table 6); although the path coefficients were numerically higher for mothers at all-time points (Figure 7), the effect was only significantly stronger from T2 attachment to T3 depressive symptoms. With respect to the reverse depressive symptoms-attachment relation, a similar difference was found, also with the effect being stronger for attachment to mothers, this time from T3 depression to T4 attachment.

Table 6. Differences in prediction effects from and to attachment to mother and father vis-à-vis depression

	$\Delta\chi^2$	*p-value*
Attachment predicting depression		
age 16	2.78	.096
age 14	5.36	.021
age 12	2.38	.12
Depression predicting attachment		
age 16	4.76	.029
age 14	0.08	.78
age 12	1.27	.26

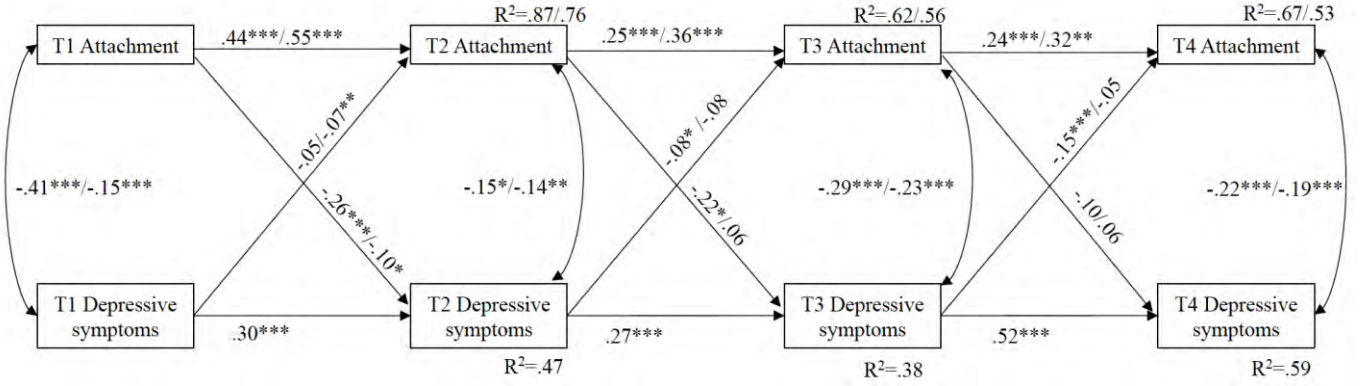

Figure 7. Cross-lagged dual path model hybrid examining the association between depressive symptoms and attachment for full sample
Note. Standardized coefficients are depicted. Results for attachment to mother are named first, results for attachment to father are named second. RMSEA = 0.016, CFI = 0.999, TLI = 0.996, SRMR = 0.015. T1/T2/ T3/T4 = Time 1/Time 2/Time 3/Time 4. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Child's Gender-Specific Effects

To test differences between boys and girls, the hybrid DPM model was run separately (Figure 8). Regarding girls, better mother-child attachment quality at T1 predicted fewer depressive symptoms at T2 and T3. Moreover, also for girls, more depressive symptoms at T3 predicted poorer mother-child attachment quality at T4. As regards girls' attachment to their father, T1 attachment seemingly protected against depressive symptoms at T2. Conversely, depressive symptoms had a potential negative impact on father-daughter attachment relationship at T2 and at T3. Regarding boys, depressive symptoms at T3 predicted poorer mother-son attachment quality at T4. Moreover, in order to test whether the above paths were different between genders, the model comparison procedure described above was used. The effect of attachment to mothers and fathers at T2 on depressive symptoms at T3 were stronger for girls than for boys (Table 7). A model constraint approach revealed, however, no differential effects for girls versus boys with respect to attachment to mothers versus fathers on later depressive symptoms.

Table 7. Gender differences in prediction effects from and to attachment to mother and father vis-à-vis depression

	Attachment to mothers		Attachment to fathers	
	$\Delta\chi^2$	*p-value*	$\Delta\chi^2$	*p-value*
Attachment predicting depression				
age 16	1.59	.21	.32	.57
age 14	6.37	.012	8.17	.004
age 12	.46	.50	.01	.97
Depression predicting attachment				
age 16	.97	.33	.01	.93
age 14	.67	.41	.88	.35
age 12	.08	.78	2.77	.096

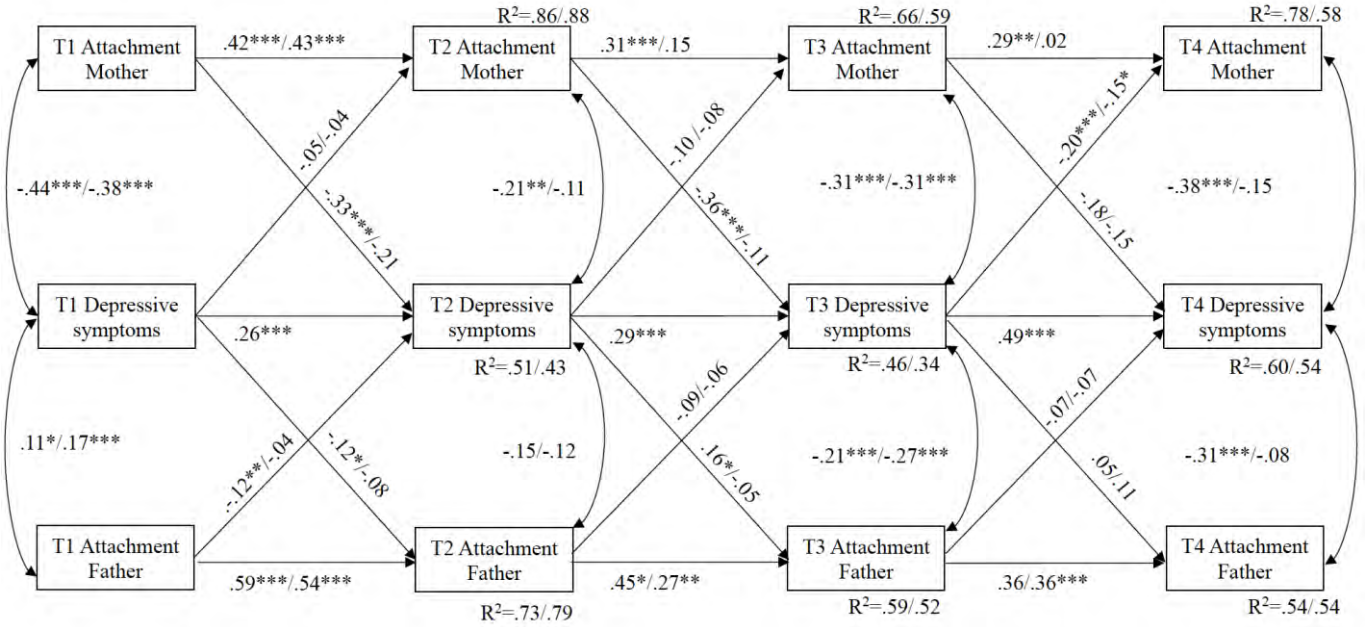

Figure 8. Dual path model hybrid examining the association between depressive symptoms and attachment to mother and father among boys and girls.

Note. Standardized coefficients are depicted. Results for girls are named first; results for boys are named second. RMSEA = 0.018, CFI = 0.999, TLI = 0.996, SRMR = 0.025. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

5.3. STUDY 3. MEDIATORS LINKING INSECURE ATTACHMENT TO EATING SYMPTOMS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Main characteristics of included studies in the review

A total of 1639 studies were selected as eligible to be screened by title and abstract, of which 102 were retrieved as potential relevant full-text and screened to determine eligibility. Eighty-one did not meet the inclusion criteria and were excluded. Finally, 21 articles were included for review and 17 of them were eligible for the meta-analysis (Figure 9).

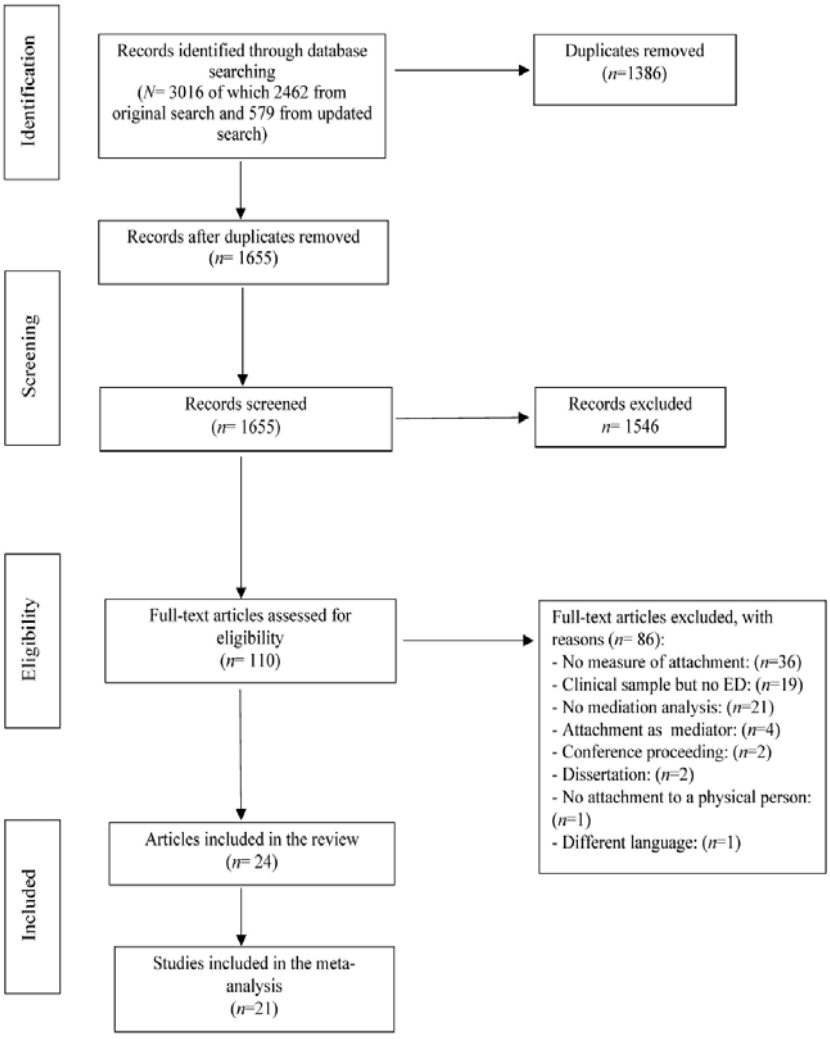

Figure 9. Flowchart for search strategy

Tables 8 and 9 show the characteristics of each study using non-clinical and clinical samples, respectively. Regarding the design of the included studies, most of them adopted cross-sectional designs (n = 20) and only one used a longitudinal design. Included studies were conducted in Australia (n = 5), US (n = 4), Italy (n = 3), Canada (n = 2), UK (n = 2), Belgium (n= 2), Sweden (n = 1), Greece (n = 1), and Germany (n = 1).

In reference to the characteristics of the sample, 14 studies used a community sample reported on adolescents (n = 2), university students (n = 8), and young adults (n = 4). Eight studies included both genders and 6 employed only women. Sample sizes ranged from 80 to 2644 participants and the mean age of participants across studies ranged from 12.9 to 39 years.

Eight studies used clinical samples and 3 studies compared two groups of clinical and healthy samples, 5 studies used exclusively samples with ED patients. Participants with ED were diagnosed using DSM-5 (n = 3), DSM-IV-TR (n = 3), or DSM-IV (n = 1). One study (Tasca et al., 2009) did not report any criteria. Sample sizes ranged from 55 to 403 patients and their mean ages ranged from 21.17 to 39 years.

Attachment was assessed using self-report measures: The Attachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan, M., 1994) (n = 3), Adult Attachment Prototypes (AAP; Crowell, Fraley, & Shaver, 1999) (n = 1), Adult Attachment scale (AAS; Collins & Read, 1990) (n = 2), and Experiences in Close Relationships (ECR; Brennan, Clark, & Shaver, 1998) (n = 15) (including original version, revised versions or version adapted to children). As attachment figure, studies assessed mother (n = 2); mother and father (n = 2); romantic partner (n = 3); parents, peers and romantic partner (n = 1) and the other studies referred to other close relationships (n = 13).

The assessed mediators were the following: emotional dysregulation (n = 4), body dissatisfaction (n = 4), social comparison (n = 3), perfectionism (n = 3), depressive symptoms (n = 2), and neuroticism (n = 2). Additionally, other personality variables such as extraversion (n = 1) and narcissism (n = 1) and other mechanisms

such as mindfulness (n = 1), hope (n = 1), fear of abandonment (n = 1), family functioning (n = 1), appearance-based rejection sensitivity (n = 1) and specific psychological ED traits (n = 1) were tested as mediators; however, results regarding these variables were inconclusive due to the reduced sample size.

Concerning the methodological quality of the 21 retrieved studies, they ranked from 3 (weak) to 8 (strong) (see Table 10 for individual study quality ratings). The pooled estimate for the indirect effect of mediating variables was 59% and 53% for low quality studies and for moderate-high quality studies, respectively. In consequence, no significant differences in our results were found regarding quality.

Table 8. Summary of reviewed studies with non-clinical samples (n = 16)

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Bäck (2011) Sweden	80 High school students M_{age} = 18, *SD* = 0.62 43,75%	CS Hierarchical regression analysis Sobel Test	Mother	AAP	Body and weight dissatisfaction through 2 items	ChEAT	Fearful	Body and weight dissatisfaction fully mediated the link secure mother attachment-eating problems Body and weight dissatisfaction partially mediated the link fearful mother attachment-eating problems	Weak
Bamford & Halliwell (2009) UK	213 Undergraduate students M_{age} = 21, *SD* = 4.1 100%	CS SEM	Close relationships	ECRQ-R	SCMPS	EDI	Anxious	Social comparison mediated the link insecure attachment-ED	Weak

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Boone (2013) Belgium	328 Adolescents M_{age} = 17.1, *SD* = 1.13 57%	CS Baron & Kenny steps Sobel test	Mother	ECR-R	-PSP subscale of PSPS -SPP subscale of MPS-H&F	Bulimia subscale of EDI-II	Avoidant	Perfectionism Self-Promotion fully mediated the link avoidant attachment to father and binge eating	Moderate
Dakanalis et al. (2016) Italy	2055 College students M_{age}= 18.34, *SD* = 0.28 52,2%	LO SEM Bootstrapping	Close relationships	ASQ	16-item Hypersensitive Narcissism Scale of NPI-40 (Italian version)	Dieting and Bulimia subscales of EAT-26	Anxious Avoidant	Vulnerable narcissism fully mediated the link attachment anxiety-future bulimic behaviors Grandiose narcissism fully mediated the association between attachment avoidance and future dieting behaviors	Moderate
Eggert, Levendosky & Klump (2007) US	85 Twins and triplets' community/university M_{age} = 20.6, *SD* = 2.7 100%	CS Hierarchical linear models regressions	Romantic partner	AAS	NEO-PI-R	MEBS	Anxious	Neuroticism fully mediated the relationship between insecure attachment and eating symptoms	Weak

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Han & Pistole (2014) US	381 University students M_{age} = 25.29, *SD* = 6.0 58%	CS SEM	Close relationships	ECR-S	DERS	BES	Insecure	Attachment insecurity and binge eating were associated and mediated by emotion dysregulation	Moderate
Kiang & Harter (2006) US	146 Undergraduate students M_{age} = 19.5 100%	CS SEM	Close relationships Mother	ECR	Ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, and maturity subscales from EDI-2	Drive for thinness and bulimia subscales from EDI-2	Anxious Avoidant	Eating psychological symptoms mediated the relationship between insecure attachment and eating behavioural symptoms	Weak
Koskina & Giovazolias (2010) Greece	481 Undergraduate students Male: M_{age} = 21.92, *SD* = 3.75 Female: M_{age} = 20.75, *SD* = 3.50 79.2%	CS Baron & Kenny steps Sobel test	Romantic partner	ECR-SR	BSQ-34	EAT-26	Anxious	Body dissatisfaction fully mediated the link insecure anxious attachment - eating Body dissatisfaction mediated the link anxious attachment and dietary in men	Weak

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
McDermott et al. (2015) US	2644 University students M_{age} = 22.5, *SD* = 5.26 46%	CS SEM Bootstrapping	Romantic partner	ECR-S	ATHS	CCAPS-62	Anxious Avoidant	Hope mediated the associations between adult attachment dimensions (anxiety and avoidance) and eating problems	Moderate
Pepping et al. (2015) Australia	Study 1 144 Undergraduate students M_{age} = 20.89, *SD* = 4.80 100%	CS Bootstrapping	Close relationships	ECR-R	FFMQ	EDI-3	Anxious Avoidant	Lower mindfulness mediated the associations of both attachment anxiety and avoidance with increased eating pathology	Weak
Schembri & Evans (2008) Australia	225 Participants community/university M_{age} = 30.24, *SD* = 10.44 100%	CS Hierarchical Multiple Regression Sobel Test	Romantic partner	Anxiety dimension from ECR	-CESD -RSE	BULIT-R	Anxious	General psychopathology (combined scores of depression and self-esteem) partially mediated the relationship between anxious attachment and bulimic symptoms	Weak

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Shanmugan, Jowett & Meyer (2012) UK	411 British athletes M_{age} = 20.95, *SD* = 3.67 61,3%	CS Bootstrapping	Mother Father Peers Coach	ECR	-FMPS -DAS -RSES -Subscale of depression of SCL-90	EDEQ	Anxious Avoidant	Self-esteem, depression, and self-critical perfectionism mediated the link insecure attachment styles-eating pathology	Moderate
Ty & Francis (2013) Australia	247 Participants community M_{age} = 24.51, *SD* = 4.05 100%	CS Bootstrapping	Close relationships	ECR-RS	-SCMPS -PACS -DERS	EAT-26	Anxious Avoidant	Social comparison and emotion dysregulation mediated between insecure attachment and disordered eating	Weak
Van Durme, Braet & Goossens (2015) Belgium	952 Adolescents primary/secondary schools M_{age} = 12.9, *SD* = 1.06 54,6%	CS Bootstrapping	Mother	ECR-R-C	FEEL-KJ	ChEDE-Q	Anxious Avoidant	Maladaptive emotion regulation partially mediated the link between insecure attachment and restraint/eating pathology concerns	Moderate

Table 9. Summary of reviewed studies with clinical samples (n = 11)

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Dakanalis et al. (2014) Italy	403 Patients with ED (AN=101, BN=167, EDNOS=135) BMI = 17 (0.9) M_{age} = 25.33, *SD* = 6.11 100%	CS SEM Bootstrapping	Close relationships	ASQ	MPS	EDI-2	Anxious Avoidant	Maladaptive perfectionism mediated between both insecure attachment patterns and ED symptoms	Moderate
De Paoli et al. (2017b) Australia	*n*=744 M_{age} = 22.53, *SD* = 7.60 Clinical group: 122 BMI = 20.98 (4.59) M_{age} = 25.16, *SD* = 7.60 98% Control group: 662 M_{age} = 22.01, *SD* = 8.63 79%	CS/ Case-control SEM	Close relationships	ECR-R	- RSQ - Appearance RS-Scale - SCRS	EDI-3	Avoidant Anxious	ED group: appearance-based RS and social rank mediated between insecure attachment and disordered eating Control group: interpersonal RS, appearance-based RS and social rank mediated between insecure attachment and disordered eating	Moderate

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
De Paoli et al. (2017a) Australia	*n*=616 M_{age} = 22.18, *SD* = 7.77 Clinical group: 108 Patients with ED (AN-R = 50, AN-BP = 15, BN = 17, OSFED = 19) BMI = 21.74 (4.23) M_{age} = 25.45, *SD* = 7.65 100% Control group: 508 Participants community/university M_{age} = 21.49, *SD* = 7.63 100%	CS/ Case-control SEM	Close relationships	ECR-R	- RSQ - Appearance RS-Scale - SCRS	EDE-Q	Anxious Avoidant	Emotional deprivation, fear of abandonment, interpersonal RS, and appearance-based RS mediated between anxious attachment and disordered eating	Moderate
Jakovina et al. (2018) Croatia	100 participants M_{age} = 20.40, *SD* = 3.26 100% Clinical Group BN = 50 Control group = 50	CS Multiple regression Sobel test	Close person	ECR-R	DERS (Difficulties in Emotion Regulation Scale)	EDI-2	Anxiety	Emotion regulation fully mediated between anxious attachment and BN symptoms.	Weak

Author/s(year) Country	Sample characteristics (n; M_{age}, SD; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Monteleone et al. (2017) Italy	n = 230 Clinical group:113 Patients with ED (AN = 71, M_{age} = 24.7, SD = 7.8; BN = 52) BMI = 18.5 – 25.0 M_{age} = 27.8, SD = 9.4;100% Control group: 117 University students M_{age} = 24.7, SD = 3.1; 100%	CS/ Case-control PROCESS Sobel test Bootstrapping	Close relationships	ECR-R	IDEA	EDI-II	Avoidant	Embodiment mediated the relationship between avoidant attachment style and ED symptomatology	Moderate
Monteleone et al. (2018) Italy	123 participants Clinical Group = 78 AN R=38 AN BP=10 M_{age} = 25.15, SD = 9 BN = 30 M_{age} = 27, SD = 9.13 Control group = 45 M_{age} = 26.25, SD = 1.95 100%	CS PROCESS Bootstrapping	Close person	ASQ	BIS-BAS (Behavioral Inhibition System-Behavioral Activation System Scale)	EDI-2	Anxiety	Sensitivity to punishment fully mediated the association between anxious attachment style and ED symptoms (drive to thinness and body dissatisfaction)	Weak

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Münch, Hunger & Schweitzer (2016) Germany	*N* = 253 M_{age}=25.72, *SD*=8.73 Clinical group:106 Participants with ED (Self-reported having ED: AN = 45, BN = 29, Other ED =12; cut-off < 20) M_{age}= 24.74, *SD* = 7.71 100% Control group: 147 Participants M_{age} = 25.72, *SD* = 8.73 100%	CS/ Case-control Bootstrapping	Close relationships	AAS	-B5T -EXIS	-EDE-Q -SEED	Insecure	Personality variables (neuroticism and introversion) and family dysfunction were found to partial mediate the relationship between insecure attachment and eating disorder	Weak
Pepping et al. (2015) Australia	Study 2 55 Patients with ED (BN = 11, BED = 18, EDNOS = 26) M_{age} = 39, *SD* = 12.66 100%	CS Bootstrapping	Close relationships	ECR-R	FFMQ	EDI-3	Anxious Avoidant	Lower mindfulness mediated the associations of both attachment anxiety and avoidance with increased eating pathology	Weak

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Redondo & Luyten (2018) Spain	361 participants Clinical Group AN= 38 M_{age} = 21.9, *SD* = 5.30 Control group = 327 M_{age} = 19.1, *SD* = 1.94 100%	CS SEM	Parents	CaMir	MAAS	EAT-26	Preocupationn Parental interference Self-Sufficiency Childhood trauma	Impairments in cognitive attention to internal mental states mediated the relationship between insecure attachment styles and ED symptoms (Dieting, Bulimia and Food preoccupation, Oral control)	Weak
Tasca et al. (2006) Canada	268 Patients with ED (ANR = 30 M_{age} = 26.4, *SD* = 10.4; ANB = 43, M_{age} = 29.8, *SD* = 10.8; BN = 57, M_{age} = 29, *SD* = 8.0; BED = 115, M_{age} = 42.3, *SD* = 10.8; EDNOS = 23 M_{age} = 26.2, *SD* = 8.6) 100%	CS SEM	Close relationships	ASQ	- Body dissatisfaction scale-EDI - Body Esteem-Appearance, Body Esteem-Weight scales-BESAA.	-Pressure to diet by family of origin, pressure to diet by current relationships, pressure to diet by authority - DSED-R -Drive for thinness scale-EDI -Restraint scale-EDEQ	Anxious Avoidant	Body dissatisfaction mediated the relationship between attachment insecurity style and restrained eating	Weak

Author/s(year) Country	Sample characteristics (*n*; M_{age}, *SD*; % female)	Design and mediation test	Attachment figure	Attachment measures	Mediator measures	Outcome measures	Attachment type	Mediation results	Quality rating
Tasca et al. (2009) Canada	310 Patients with ED (AN=74, BN=138, EDNOS=98) BMI = 21.88 (6.20) M_{age}=26.31, *SD*=8.76 100%	CS SEM Bootstrapping	Close relationships	ECR	-DSI-R -PAI	EDI	Anxious	Emotional reactivity mediated the relationship between attachment anxiety contributed and both depressive symptoms and ED symptoms Emotional deactivation did not mediate the relationship between avoidance attachment and ED symptoms	Moderate

Table 10. Quality assessment of the included studies

	Aim clear	Design appro-priate to aim	Sample repre-sentative	Psycho-metric charact eristics	Accepta-ble methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control Con-founding factors	Final Rating
Bäck (2011)	1	1	0	0	0	0	0	0	1	**3**
Bamford & Halliwell (2009)	1	1	0	1	1	0	0	1	0	**5**
Boone (2013)	1	1	0	1	1	0	0	1	1	**6**
Dakanalis et al. (2013)	1	1	0	1	1	0	0	1	1	**6**
Dakanalis et al. (2016)	1	1	0	1	1	1	1	1	1	**8**
De Paoli et al. (2017)	1	1	0	1	1	0	0	1	1	**6**
De Paoli et al. (2017)	1	1	0	1	1	0	0	1	1	**6**
Eggert et al. (2007)	1	1	0	1	0	0	0	1	0	**4**
Han & Pistole (2014)	1	1	0	1	1	0	0	1	1	**6**
Jakovina et al. (2018)	1	1	0	1	0	0	0	1	1	**5**
Kiang & Harter (2006)	1	1	0	1	1	0	0	1	0	**5**
Koskina & Giovazolias (2010)	1	1	0	1	0	0	0	1	1	**5**
McDermott et al. (2015)	1	1	1	1	1	0	0	1	0	**6**
Monteleone et al. (2017)	1	1	1	1	1	0	0	1	0	**6**
Münch, Hunger & Schweitzer (2016)	1	0	0	1	1	0	0	1	0	**3**
Monteleone et al. (2018)	1	1	0	1	1	0	0	1	0	**5**
Pepping et al. (2015)	1	1	0	1	1	0	0	1	0	**5**
Redondo & Luyten (2018)	1	1	0	1	1	0	0	1	0	**5**
Schembri & Evans (2008)	1	1	1	1	0	0	0	1	0	**5**
Shanmugan, Jowett & Meyer (2012)	1	1	1	1	1	0	0	1	1	**7**
Tasca et al. (2006)	1	1	0	1	1	0	0	0	0	**4**
Tasca et al. (2009)	1	1	0	1	1	0	0	1	1	**6**
Ty & Francis (2013)	1	1	0	1	1	0	0	1	0	**5**
Van Durme, Braet & Goossens (2015)	1	1	1	1	1	0	0	1	1	**7**

Meta-analysis

Table 11 presents the pooled regression coefficients for path *a*, path *b*, total effect and indirect effect, with their CIs, the I^2 statistic and effect sizes of each mediation model (mediation ratio). Please, detailed extracted and coded data for meta-analysis in Appendix 8.

Table 11. Random effects pooled correlation coefficients of path a, path b, indirect effect and total effect; heterogeneity and mediation ratio

	# Models	Path *a* (95% CI)	I^2	Path *b* (95% CI)	I^2	Path *c* (95%CI)	I^2	Path *a*b* (95%CI)	I^2	|a*b/c|
Total	21	0.32 (0.13-0.49)	0.98	0.34 (0.19-0.47)	0.97	0.28 (0.20-0.37)	0.92	0.17 (0.10-0.23)	0.85	0.61
Clinical sample	6	-0.08 (-0.52-0.40)	0.99	0.04 (-0.41-0.34)	0.98	0.10 (-0.20-0.38)	0.96	0.01 (-0.18-0.20)	0.90	0.10
Non-clinical sample	14	0.45 (0.28-0.59)	0.97	0.45 (0.34-0.55)	0.95	0.34 (0.27-0.40)	0.80	0.20 (0.14-0.26)	0.75	0.59
Anxious	15	0.34 (0.12-0.53)	0.98	0.34 (0.15-0.50)	0.98	0.31 (0.21-0.40)	0.92	0.17 (0.10-0.24)	0.84	0.55
Avoidant	12	0.11 (-0.06-0.27)	0.96	0.20 (0.02-0.37)	0.97	0.22 (0.14-0.30)	0.85	0.09 (0.03-0.15)	0.70	0.41
High quality	9	0.20 (-0.12-0.48)	0.99	0.22 (0.01-0.41)	0.93	0.15 (-0.01-0.30)	0.95	0.08 (-0.04-0.20)	0.92	0.53
Low quality	12	0.41 (0.16-0.60)	0.98	0.42 (0.20-0.60)	0.97	0.37 (0.31-0.43)	0.65	0.23 (0.17-0.28)	0.51	0.62
Females only	15	0.34 (0.08-0.55)	0.98	0.38 (0.17-0.56)	0.98	0.33 (0.22-0.44)	0.93	0.19 (0.10-0.27)	0.83	0.58
Dysfunctional ER	5	0.33 (-0.24-0.73)	0.99	0.31 (-0.01-0.57)	0.98	0.21 (-0.06-0.45)	0.97	0.15 (-0.06-0.35)	0.95	0.71
Clinical	1	-0.64 (-0.70 - -0.57)	--	-0.37 (-0.46 - -0.27)	--	-0.35 (-0.44 - -0.25)	--	-0.24 (-0.34 - -0.13)	--	0.69
Non clinical	3	0.52 (0.001-0.81)	0.99	0.42 (0.24-0.57)	0.93	0.30 (0.16-0.43)	0.86	0.21 (0.01-0.40)	0.93	0.70
Depressive symptoms	2	0.49 (0.34-0.61)	0.80	0.52 (0.41-0.62)	0.70	0.35 (0.20-0.48)	0.73	0.25 (0.12-0.57)	0.64	0.71
Clinical	0	--	--	--	--	--	--	--	--	
Non clinical	2	0.49 (0.34-0.61)	0.80	0.52 (0.41-0.62)	0.70	0.35 (0.20-0.48)	0.73	0.25 (0.12-0.57)	0.64	0.71
Body dissatisfaction	4	0.35 (0.25-0.44)	0.42	0.53 (0.26-0.72)	0.94	0.31 (0.21-0.41)	0.46	0.18 (0.05-0.30)	0.62	0.58
Clinical	2	0.28 (0.19-0.36)	0	0.34 (0.10-0.53)	0.80	0.31 (0.22-0.40)	0	0.08 (-0.02-0.18)	0	0.26
Non clinical	2	0.43 (0.34-0.52)	0	0.67 (0.60-0.72)	0	0.39 (0.001-0.68)	0.81	0.28 (0.18-0.38)	0	0.72
Neuroticism	2	0.83 (0.10-0.98)	0.99	0.43 (0.30-0.55)	0.43	0.52 (0.44-0.59)	0	0.28 (0.18-0.38)	0	0.54
Clinical	0	--	--	--	--	--	--	--	--	
Non clinical	2	0.83 (0.10-0.98)	0.99	0.43 (0.30-0.55)	0.43	0.52 (0.44-0.59)	0	0.28 (0.18-0.38)	0	0.54
Perfectionism	3	0.35 (0.15-0.53)	0.92	0.38 (0.28-0.46)	0.71	0.27 (0.14-0.39)	0.81	0.14 (0.03-0.25)	0.72	0.52
Clinical	1	0.51 (0.43-0.58)	--	0.46 (0.38-0.53)	--	0.37 (0.28-0.45)	--	0.24 (0.15-0.33)	--	0.65
Non clinical	2	0.26 (0.08-0.43)	0.85	0.33 (0.26-0.39)	0	0.21 (0.07-0.35)	0.74	0.09 (0.02-0.16)	0	0.43
Mindfulness	2	-0.37 (-0.45--0.29)	0	-0.34 (-0.42--0.25)	0	0.27 (0.18-0.35)	0	0.12 (0.03-0.21)	0	0.44
Clinical	1	-0.33 (-0.55--0.07)	--	-0.46 (-0.64--0.22)	--	0.42 (0.31-0.52)	--	0.15 (-0.13-0.40)	--	0.36
Non clinical	1	-0.40 (-0.53--0.25)	--	-0.32 (-0.46--0.17)	--	0.37 (0.22-0.50)	--	0.13 (-0.03-0.29)	--	0.35
Social comparison	3	0.02 (-0.43-0.45)	0.97	0.27 (-0.47-0.79)	0.99	0.14 (-0.24-0.48)	0.95	0.03 (-0.22-0.28)	0.86	0.21
Clinical	1	-0.49 (-0.61 - -0.34)	--	-0.53 (-0.65 - -0.39)	--	-0.30 (-0.45 - -0.13)	--	-0.26 (-0.42 - -0.09)	--	0.87
Non clinical	2	0.28 (0.19-0.36)	0	0.61 (0.24-0.83)	0.98	0.35 (0.26-0.42)	0	0.17 (0.07-0.26)	0.16	0.49

Note. **Path *a*:** association between independent variable and mediator; **Path *b*:** association between mediator and dependent variable; **Path *c*:** total effect of the independent variable on the dependent variable; ***a*b*:** the indirect effect of the independent variable on the dependent variable controlling the mediator; I^2: heterogeneity; **|a*b/c|:** mediation ratio, effect size in mediation analysis.

Primary analyses

Fifty six percent of the total effect of insecure attachment on eating disorder symptoms was explained by the indirect effect of the main mediating variables (i.e., maladaptive emotion regulation strategies, depressive symptoms, body dissatisfaction, neuroticism, perfectionism and social comparison). Heterogeneity was substantial overall and similarly high after stratification by sample, type of attachment or female sample, in exception for the subgroup of studies of low quality and those subgroups which included only 2 studies (such as neuroticism). Consequently, we presented the random effects analyses as recommended by experts and included the fixed effects results for comparison purposes only (see Appendix 9).

Comparing sample types, in non-clinical samples the percentage of the total effect explained by the indirect effect was larger (62%) than in clinical samples (14%). Regarding attachment style, the percentage of the total effect explained by the indirect effect was 57% with anxious attachment and 43% with avoidant attachment. Additionally, the effect size of the mediating variables did not significantly differ by gender since the inclusion of men in the sample yielded similar results (56%) to the studies with female-only samples (59%).

Subgroup analysis by mediators

Maladaptive emotion regulation

Overall, the percentage of the total effect explained by the indirect effect was 71%. The pooled estimates of the indirect effect of maladaptive emotion regulation strategies were significant (70%) in studies with non-clinical population. The percentage of the total effect explained by the indirect effect was 69%.

Depressive symptoms

The pooled estimate for the indirect effect of depressive symptoms was significant and large among non-clinical population. The percentage of the total effect explained by the indirect effect was 71%. No study evaluated this model among patients with ED.

Body dissatisfaction

Overall, the percentage of the total effect explained by the indirect effect was 58%. The pooled estimates of the indirect effect of body dissatisfaction were significant in studies with non-clinical population (72%). However, body dissatisfaction did not significantly mediate the relationship between insecure attachment and ED symptoms in two studies with clinical samples; 26% of the total effect that was explained by the indirect effect.

Neuroticism

The pooled estimate for the indirect effect of neuroticism was significant among non-clinical population. The 54% of the total effect was explained by its indirect effect. No study evaluated this model among patients with ED.

Perfectionism

Overall, the 52% of the total effect was explained by the indirect effect of maladaptive perfectionism. The pooled estimate for the indirect effect was significant in studies with non-clinical sample, 43% of the total effect was explained by its indirect effect. Only one study found that perfectionism was a significant mediator between insecure attachment and ED symptoms among a sample with ED patients.

Social comparison

Overall, the percentage of the total effect that was explained by the indirect effect was 21%. The 49% of the total effect was explained by its indirect effect. Only one study found that social comparison was a significant mediator between insecure attachment and ED symptoms among a sample with ED patients. The percentage of the total effect that was explained by the indirect effect was 87%.

Additional mediators

Some studies reported results on other mediators between insecure attachment style and ED symptoms. However, the number of

studies for each mediator was less than 2 so they were not included in the current meta-analysis (more details of these studies can be found in Appendix 10).

Publication bias

Funnel plots did not provide evidence for publication bias (Figure 10). However, because funnel plots have several limitations and represent only an informal way to detect publication bias (Sutton, Abrams, Jones, Sheldon, & Song, 2000), we carried out more formal testing using the test proposed by Egger et al. (1997). For the total effect (path *c*), the Egger's test yielded a *p* value of .26. Further, the Trim and Fill method suggested that five studies might be missing. Without these five potential studies, the pooled *r* was 0.27 (95%CI: 0.17-0.37). Adding the five suggested studies, the pooled *r* was 0.20 (95%CI: 0.10-0.29). Similarly, for the indirect effect (path *a*b*), there was no sign of publication bias since the Egger's test yielded a *p* value of .29. The Trim and Fill method suggested adding four studies. Without these four potential studies, the pooled *r* was 0.15 (95%CI: 0.08-0.23). With the four added studies, the pooled *r* was 0.11 (95%CI: 0.03-0.18).

To further evaluate the possibility that our results could be due to publication bias, we performed sensitivity analysis. This analysis recalculated our pooled estimates under the following extreme assumptions: (1) published studies are only half of the studies identifying mediating variables between insecure attachment and ED symptoms, (2) all unpublished studies found an *r* of 0, (3) the unpublished studies have a sample size that is the same as the sample average of the published studies. Under these extreme assumptions, the pooled *r* for path *c* was still significant [0.14 (95%CI: 0.07-0.20)]. Similarly, the pooled *r* for path *a*b* showed significance [0.07 (95%CI: 0.03-0.11)]. As such, these analyses indicate that it is highly unlikely that the observed effects could have been undermined by publication bias.

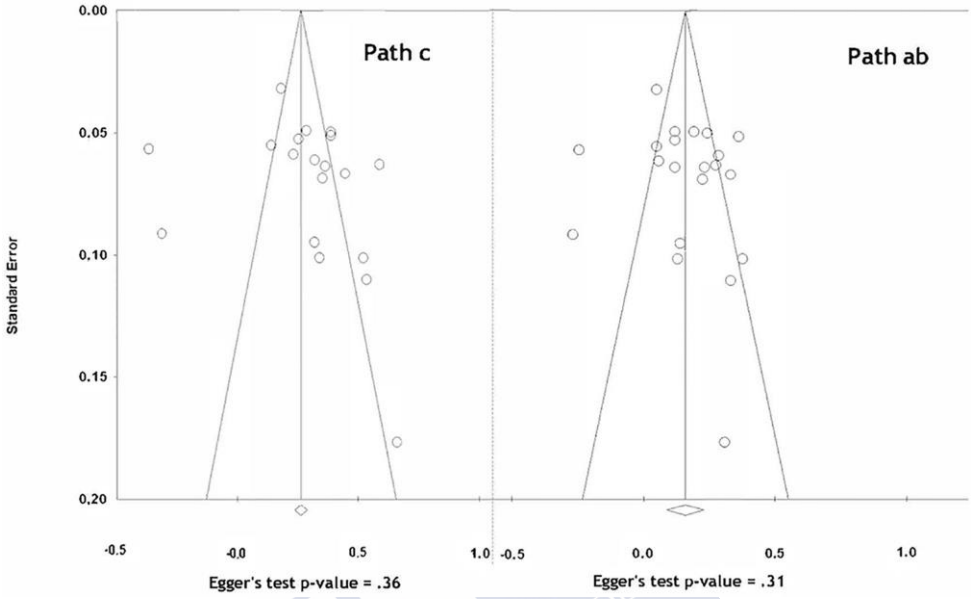

Figure 10. Funnel plots of correlations versus variance of correlations for total effect (path c) and indirect effect (path a*b).
Note. Left hand side: Funnel plot for the total effect (path c). Right hand side: Funnel plot for the indirect effect (path a*b). In both charts, Egger's test *p-value* shows no publication bias ($p > .05$).

5.4. STUDY 4. MEDIATIONAL MECHANISMS INVOLVED IN THE RELATION BETWEEN ATTACHMENT INSECURITY AND DEPRESSION: A META-ANALYSIS

Main characteristics of included studies in the review

A flow diagram of the screening process from identification through to inclusion is presented in Figure 11. Initially, a total of 1237 records were selected as eligible to be screened by title and abstract, of which 213 were retrieved as potential relevant full-text and screened to determine eligibility. Among them, 105 did not meet the inclusion criteria and were excluded. Finally, 108 studies met inclusion criteria and were included for review (88 studies from peer-review journals, 1 conference proceeding and 19 doctoral dissertations), and out of them, 80 were eligible for the meta-analysis (66 studies from peer-review journals and 14 doctoral dissertations). Study characteristics are summarised in Table 12. A total of 93 cross-sectional studies and 15 longitudinal studies provided data on mediational mechanisms. Sample sizes ranged from 53 to 5065 participants and the mean age of participants across studies ranged from 3.7 to 72.08 years (mostly, adolescent university students and young adults). The majority of studies included both genders.

Attachment was assessed using a broad variety of self-report measures, but the most commonly used were: the Experiences in Close Relationships (ECR; Brennan, Clark, & Shaver, 1998), the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987); the Adult Attachment Scale (AAS; Collins & Read, 1990); the Relationships Questionnaire (RQ; Bartholomew & Horowitz, 1991); and the Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994).

The main mediators explored in the reviewed literature can be divided into four categories related to the cognitive (i.e., dysfunctional attitudes, low self-esteem, maladaptive perfectionism, self-criticism, self-compassion, low sense of coherence, over-dependence, self-disclosure), emotional (i.e., emotional dysregulation, alexithymia and coping strategies) and interpersonal domain (i.e., perceived social

support, relational satisfaction, social comparison, social self-efficacy, interpersonal stressors). Other studies reported mediational effects with respect to different variables, but the results were inconclusive due to the reduced sample size and therefore were not included in the meta-analysis (see Appendix 11).

The methodological quality of the 108 retrieved studies ranked from 2 (weak) to 9 (strong) (see Table 13 for individual study quality ratings). The pooled estimate for the indirect effect of mediating variables was 40%, for low quality studies, and 35% for moderate-high quality studies. In consequence, no significant differences in our results were found regarding quality.

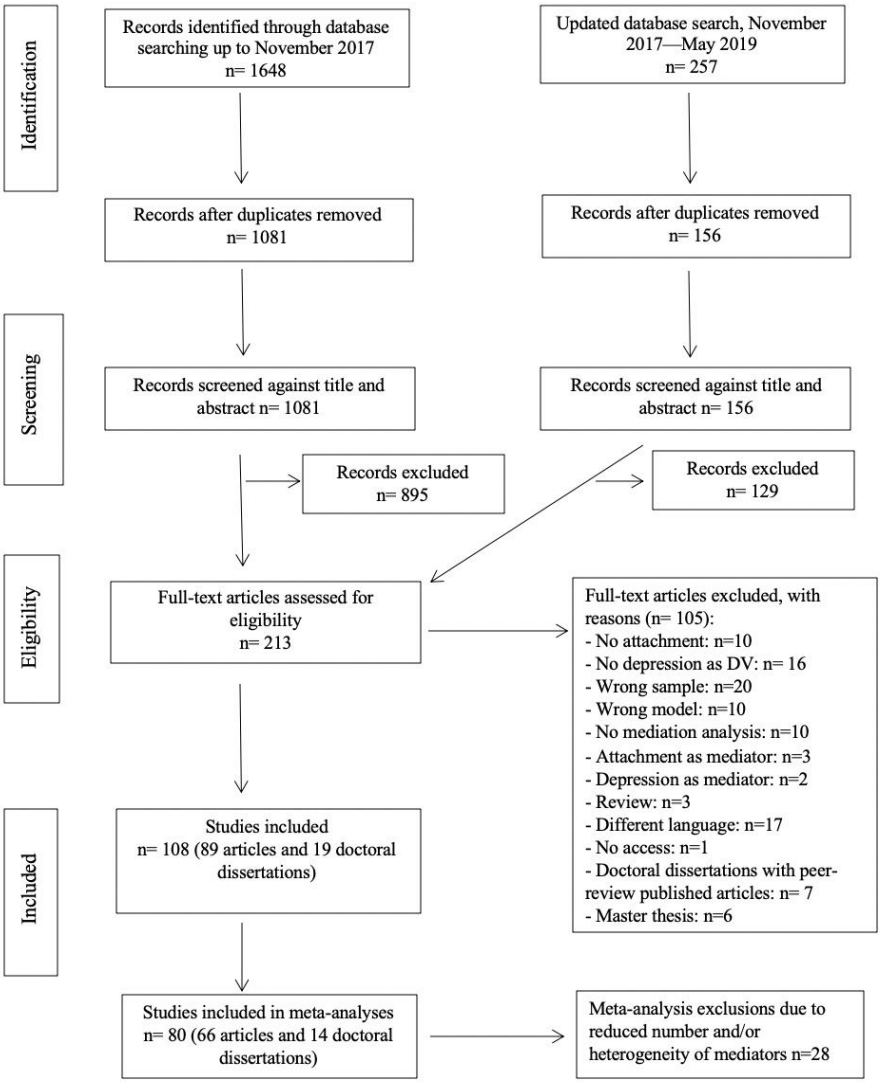

Figure 11. Flowchart for search strategy

Table 12. Main characteristics of included studies

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Aderka et al. (2009) Israel	102	M_{age}=29.5, *SD*=9.0 70.6%	CS	Baron & Kenny steps (1986)	ECR	SoCS SBS LSAS-SR	BDI	- Social Anxiety	**5**
Altin & Terzi (2010) Turkey	146	M_{age}=20.34, *SD*=1.68 22.2%	CS	Baron & Kenny steps (1986)	RSQ	MRQ	BDI	- Relational satisfaction *Dependence* - Relational monitoring	**4**
Besser & Priel (2008) Israel	113	M_{age}=72.08, *SD*=3.55 46%	CS	Baron & Kenny steps (1986)	RQ	DEQ	CES-D	*Dependence* - Neediness	**5**
Beyderman & Young (2016) UK	100	M_{age}=46.60, *SD*=10.43 60%	CS	PROCESS Bootstrapping	ECR	RRS	DID	*Cognitive hyperactivating strategies Repetitive thinking* - Brooding rumination	**5**
Bishop et al. (2018) US	251	M_{age}=19.45 Range 18-25. 40.4%	CS	Path analyses SEM	ERC-R	IRRBS	PHQ	- Role balance	**6**
Boo (2010) US Thesis	218	M_{age}=21.5, *SD*=3.4 78.4%	CS	SEM	AAQ ECR-R	RSE	BDI-II CES-D	- Self-Esteem	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Bosacki et al. (2007) Canada	7290	M_{age}=15, *SD*=1.4 52%	CS	Baron & Kenny steps (1986) Sobel Test	IPPA	RSE	CES-D	- Self-esteem	**6**
Bozanoglu et al. (2017) Turkey	374	M_{age}=16.08 59%	CS	SEM Bootstrapping	IPPA	BAFL	BSI	- Gap between experience and language	**5**
Brenning et al. (2012) Belgium	Study 1: 339 Study 2: 746	M_{age}=12.6, *SD*=0.67 63% M_{age}=12, *SD*=1.23 59%	CS	SEM	ECR-R	ERI	CDI	- Emotion dysregulation	**5**
Burnette et al. (2009) US	221	M_{age}=19.30, *SD*=15.85 64%	CS	SEM	ECR-R	TFS b IRI RRQ	CES-D	*Cognitive hyperactivating strategies* *Repetitive thinking* - Reflection rumination - Empathy (lack) - Forgivingness	**3**
Cantazaro & Wei (2010) US	424	M_{age}=19.45, *SD*=1.88 62%	CS	SEM Bootstrapping	ECR	DEQ PSI-II	SRDS CES-D DASS	- Dependence - Self-Criticism	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Chaowiang (2008) US Thesis	950	M_{age}=17, *SD*=0.9 56%	CS	Multiple regressions analysis	IPPA	ACSQ	CES-D	*Dysfunctional attitudes* -Negative cognitive Styles	**5**
Chen et al., 2018 China	1955	M_{age}=14.85, *SD*=2.86 50%	CS	PROCESS Bootstrapping	IPPA	ERQ	CES-D	*Cognitive hyperactivating strategies* - Cognitive reappraisal *Emotional dysregulation* - Expressive suppression	**7**
Chi Kuan & Bond (2010) Hong Kong & US	367	Hong Kong=150 M_{age}=20.44, *SD*=1.90 54% US=209 M_{age}=19.03, *SD*=1.23 52.1%	CS	SEM	ECR	RSS SSQ	CES-D	- Perceived Social Support from romantic partner - Relationship Satisfaction with romantic partner	**5**
Clout & Brown (2016) Australia	105	M_{age}=31.6, *SD*=4.35 100%	LO	Baron & Kenny steps (1986) Bootstrapping	ECR ECR-R	DAS	DASS EPDS	- Emotional dysregulation *Relational satisfaction* - Dyadic satisfaction	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Cohen et al. (2013) China	1150	M_{age}=16.26 [14,19] 52%	LO	Multilevel mediation Bootstrapping	AAQ	ALEQ	CES-D	- Interpersonal stressors	**7**
Cooley et al. (2010) US	93	M_{age}=20.66, *SD*=5.55 100%	CS	Baron & Kenny steps (1986)	RQ	ICQ	BDI-II	*Behavioral hyperactivating strategies*: - Conflict management	**4**
Cooper-Newark (2015) UK Thesis	225	M_{age}=17 44.4%	CS	PROCESS macro Bootstrap	ECR-R-GSF	IIP-SC	BDI-II	Affiliative interpersonal problems (Low/High): - Vindictive - Cold - Socially Avoidant - Nonassertive - Exploitable - Overly Nurturant - Intrusive - Domineering	**5**
Cruddas et al. (2012) UK	92	M_{age}=24.26, *SD*=7.84 87%	CS	Baron & Kenny steps (1986) Sobel test	AAS	ITQ-FD	DASS	- Fear of self-disclosure	**3**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Dagnino et al. (2017) Chile	70	M_{age}=41.47, *SD*=12.91 83%	CS	MACRO (Preacher & Hayes) Bootstrap	ECR	DEQ SSQ-short form	BDI	- Self-criticism - Dependence	**5**
Eberhart & Hammen (2010) US	104	M_{age}=18.82, *SD*=1.24 100%	LO	Baron & Kenny causal steps (1986) Sobel test	ECR-R	Daily Diary Romantic Life Stress Interview	BDI-II	*Relational conflict* - Romantic Conflict Stress	**6**
Felton & Jowett (2015) UK	241	M_{age}=20.74, *SD*=2.23 64%	CS	Bootstrapping MEDIATE macro	CAAS	PNTS	BSI	- Need of thwarting sport	**5**
Gaylord-Harden et al. (2009) US	393	M_{age}=12.03, *SD*=.85 55%	LO	Baron & Kenny steps (1986) SEM	IPPA	CCSC	CDI	*Behavioural hyperactivating strategies* - Active - Support-seeking - Distraction - Avoidant	**6**
Gnilka et al. (2013) US	180	M_{age}=21.2 74.4%	CS	Baron & Kenny steps (1986) Bootstrapping	ECR-R	APS-R	KDS	- Maladaptive perfectionism	**5**
Graham (2018) UK Thesis	53	M_{age}=15.52, *SD* = 1.15 75% female	CS	PROCESS Boostraping	AAQ	SCS RSE	RCADS	- Self-compassion - Self-esteem	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Gülüm & Dag (2014) Turkey	Study 1. 992 Study 2. 875	M_{age}=20.70, *SD*=2.22 66.6% M_{age}=21.1, *SD*=1.90 66.4%	CS	SEM Baron & Kenny steps (1986) Sobel test	ECR-R	LCS RTQ	BDI	- Locus of Control - Repetitive thinking	**3**
Halpern et al. (2012) Canada	189 ambulance workers	M_{age}=37.4, *SD*=9.2 38%	CS	Stepwise regression analysis (Baron & Kenny, 1986).	RSQ	Five components of the acute stress reaction	CES-D	- Slower recovery from social withdrawal - Physical arousal following the critical incident	**2**
Han & Lee (2011) US	134	M_{age}=21.44, *SD*=1.50 57.3%	CS	Stepwise regression analysis (Baron & Kenny, 1986) Sobel test	IPPA	SOC	CES-D	- Low sense of coherence	**4**
Hankin et al. (2005) ÚS	**Study 2** 202 **Study 3** 233	M_{age}=19.5, *SD*=2.08 75% M_{age}=18.6, *SD*=0.84 70%	LO	SEM	AAS	DAttS RSE NLEQ	IDD	- Dysfunctional attitudes - Low self-esteem - Interpersonal stressors	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Hopkins et al. (2018) US	796	M_{age}=4.44 50.9%	LO	Path analysis SEM Bootstrapping	AQS	CBQ	DISC-YC	Effortful control	**9**
Irons & Gilbert (2005) UK	140	M_{age}=14.63 45%	CS	Stepwise regression analysis (Baron & Kenny, 1986)	AQ-C	ASCS-R ASBS	CDI	*Social comparison* - Social rank - Dependence	**4**
Joeng et al. (2017) South Corea	473	M_{age}=25.24, *SD*=3.78 39%	CS	SEM	ECR-R	SCS FSSS	CES-D	Self-compassion	**5**
Kamkar et al. (2012) Canada	140	M_{age}=12.65, *SD*=.70 62.14%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	ARSQ CASQ-R	SDQ-II-GSE	CDI	*Dysfunctional attitudes* - Attributions for negative events - Self-esteem	**5**
Kang et al. (2014) UK	254	Postpartum group: M_{age}=32.30, *SD*=3.53 Non-postpartum group: M_{age}=35.75, *SD*=3.43 100%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	RQ	RSE	BDI	- Low self-esteem	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
									5
Keleher et al. (2010) **US**	163	M_{age}=30, *SD*=11.21 100%	CS	SEM Bootstrapping	ECR-S	LIHS MSPSS	DASS	*Perceived social support* - Perceived general support of others - Positive Feelings about being a Lesbian	
Kenney (2006) **US Thesis**	5065	M_{age}=- *SD*=- Early-late adolescents 51.82%	CS	Multiple regressions	Parent-child attachment survey	RSE	CES-D	- Self-esteem	**5**
Kenny et al. (1993) **US**	207	Mage=13.17, SD=.43 44.4%	CS	SEM	PAQ	SPPA	CDI	- Low self-esteem	**5**
Kenny & Sirin (2006) **US**	81	M_{age}=25.98, *SD*=1.42 39.5%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	PAQ	ASPP	CES-D	- Low self-esteem	**5**
Kidd & Sheffield (2005) UK	191	M_{age}=27, *SD*=4 73.8%	CS	ANCOVA	AAS-R	STAI-II PSSQ	GHQ-28	- Anger - Social support	**3**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Korolly (2017) US Thesis	222	With partner: M_{age}=31.52, *SD*=11.10 77.2% Single: M_{age}=29.24, *SD*=11.05 75.6%	CS	Bootstrap	ECR-S	IOS Scale	CES-D	- Low sense of coherence *Dependence* - Desire for closeness to best friend - Desire for closeness to romantic partner	**6**
Kullik & Petermann (2013) Germany	248	M_{age}=14.41, *SD*=1.39 51.2%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Bootstrapping	IPPA	REQ	CES-D	*Cognitive hyperactivating coping strategies* - Internal emotion regulation *Behavioural hyperactivating coping strategies* - External emotion regulation	**6**
Land (2012) US Thesis	120	M_{age}=22, *SD*=2.87	CS	Baron & Kenny steps	ECR-S	RRS	CES-D	*Cognitive hyperactivating strategies* -Brooding rumination	**4**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Leal (2018) US/Mexico Thesis	235	Mexican-american sample: M_{age}= 22.77 (SD = 3.77) 63.80%	CS	PROCESS Bootstrap	ECR-S	Shere's Social self-efficacy Scale	CESD-R	- Social self-efficacy	**5**
	360	Mexican sample: M_{age} = 19.83, *SD*= 2.02 45.60%							
Lecompte et al. (2014) Canada	68	T1: M_{age}=3.7, *SD*=4.4 T2: M_{age}=11.7, *SD*=4.3 48.5%	LO	Hierarchical multiple regressions (Baron & Kenny, 1986) Bootstrapping	Separation-reunion procedure	SPPC	DIC- DS	- Low self-esteem	**6**
Lee & Hankin (2009) US	350	M_{age}=14.5, *SD*=1.4 57%	LO	SEM	ECR	CDAS SPPC	CDI	- Dysfunctional attitudes - Self-esteem	**8**
Lee & Koo (2015) Korea	176	M_{age}=32.84, *SD*=3.45 100%	CS	Process Bootstrapping	K-RQ	MES K-RSE	K-BDI	- Low self-esteem	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Li et al. (2015) Italy China	2632	China=1305 M_{age}=14.07, *SD*=1.37 49.6% Italy=1327 M_{age}=13.84, *SD*=1.46 53.05%	CS	SEM Bootstrapping	IPPA-R	ASC	CDI	- Self-control	**6**
Linares et al. (2016) Spain	505	M_{age}=26.72, *SD*=11.16 76.3%	CS	PROCESS Bootstrapping	RQ	FFMQ	CES-D	- Metacognition	**6**
Lindsay (2007) US Thesis	117	Mage = 12.6, SD=1.03 60%	CS	Path analyses	PAQ	RRS	CES-D	*Cognitive hyperactivating strategies Repetitive thinking* -Brooding rumination -Reflection rumination	**5**
Liu (2006) Taiwan	1144	M_{age}=14, [13-14] 45.63%	CS	SEM	CPS	CESBQ PSS-Fr	CDI	*Perceived social support* - Peer support - Social Expectation	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Lopez et al. (2001) US	55	M_{age}=21.75, *SD*=4.74 69.09%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986)	ECR-S	PF-SOC	DACL	- Deactivating coping strategies - Cognitive hyperactivating coping strategies	**5**
Love & Murdock (2012) US	167	M_{age}=20.5, *SD*=2.39 56%	CS	SEM	PAQ	SEQ-G TI-GT	COPAS-D	- Low self-esteem - Trustworthiness	**5**
Marchand-Reilly (2009) US	110	M_{age}=19.85 75.45%	CS	Baron & Kenny steps	AAS	CRBQ	CES-D	- Attacking conflict behaviours	**4**
Marganska et al. (2013) US	284	M_{age}=20.5, *SD*=4.8 80.9%	CS	SEM Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	RSQ	DERS	BDI-II	- Emotion dysregulation	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Margolese et al. (2005) Canada	134	M_{age}=16.95, *SD*=.74 65.7%	CS	Hierarchical regression analysis	RQ	Vignette task: coping items about rumination and maladaptive attributions	BDI	*Dysfunctional attitudes* - Maladaptive attributions *Cognitive hyperactivating coping strategies Repetitive thinking* - Rumination	**5**
Marks et al. (2016) Australia	343	M_{age}=33.93, *SD*=12.29 78.13%	CS	SEM Bootstrap	ECR	AES	GHQ-28	- Emotional intelligence	**5**
Martin (2001) US Thesis	112	M_{age}=43.3, *SD*=14.1 56%	CS	Hierarchical Regression Analysis	RQ	CTI	SRDS	*Dysfunctional attitudes* -Cognitive Triad	**6**
Martin (2008) US Thesis	174	M_{age}=32, *SD*=9.9 0%	CS	Regression Analysis	ASQ	ICG-R	BDI-II	Complicated Grief	**5**
McDermott et al. (2015) US	2644	M_{age}=22.5, *SD*=5.26 46%	CS	SEM Bootstrapping	ECR-S	ATHS	CCAPS-62	- Hope	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Mendes (2019) Portugal	91 adults	M_{age}=24, *SD*=5.26 100%	CS	SEM	AQ-C	SSPS	DASS	- Social safeness	**3**
Merlo (2005) US Thesis	150	M_{age}=15.75, *SD*=1.13 53%	CS	Baron & Kenny steps Bootstrap	AAQ	CSI	CES-D	*Behavioral hyperactivating strategies* - Coping strategies	**5**
Milne and Greenway (2007) *Australia*	82	M_{age}=15.25, *SD*=0.68 63%	CS	Regression analyses Sobel test	IPPA-Parent	DEQ-A SII IPPA-Peers	SRDS	- Peer attachment - Anaclictic depression - Separation-individuation - Introjective Depression	**3**
Mohammadkhani et al. (2018) Iran	175	M_{age}= 21, *SD* = 2.75 57.7%	CS	PROCESS Bootstrapping	AAQ	RRS	BDI-II	*Cognitive hyperactivating coping strategies Repetitive thinking* - Brooding rumination	**3**
Monti & Rudolph (2014) US	417	M_{age}=37.83, *SD*=6.51 100%	LO	SEM Bootstrapping	RSQ	EAQ	MASQ	- Alexithymia	**7**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Ng & Hou (2017) China	284	M_{age}=21.75, *SD*=2.43 82.4%	CS	SEM	ECRRS (Chinese version)	10 items Non-validated	BDI-II	- Contentment-Intensity - Contentment-Duration	**5**
Nichols (2005) UK Thesis	147	M_{age}=23.78, *SD*=7.37 81.8%	LO	Baron & Kenny steps	ECR-S PBI	The Defeat Scale, Social Comparison scale	The Symptom Check List - 90 Depression Subscale	Involuntary Defeat Strategy	**5**
Owens et al. (2018) US	336	M_{age}=19.26, *SD* = 3.70 64%	CS	PROCESS Bootstrapping	ECR-S	DERS	DASS	- Emotional dysregulation *Alexithymia* - Lack of awareness	**6**
Paech et al. (2015) Germany	343	M_{age}=34.0 38.2%	CS	SEM Bootstrapping	ECRQ	Ryff's scales of Psychological Well-being-short version	CES-D	*Social self-efficacy* - Environmental mastery *Relational satisfaction* - Positive relations with others	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Permuy et al. (2010) Spain	164	M_{age}=21.26, *SD*=2.30 86.8%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	RQ	PSI-II	BDI	- Dependence *Self-criticism* - Sociotropy - Autonomy	**4**
Pickard et al. (2016) Australia	151	M_{age}=21.28, *SD*=5.89 73.5%	CS	PROCESS Bootstrapping	RQ	FFMQ DERS	DASS-42	- Mindfulness - Emotional dysregulation	**5**
Puissant et al. (2011) Belgium	225	M_{age}=15.67, *SD*=1.83 72%	CS	Multiple regression model	IPPA AQ-C	ASCS-R ASBS	CES-D	- Dependence *Social comparison* - Social rank	**4**
Reinecke & Rogers (2001) US	54	M_{age}=38, *SD*=13.6 57.4%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986)	AAS-R	DAttS	BDI	Dysfunctional attitudes	**5**
Reis & Grenyer (2002) Australia	245	M_{age}=21.38, *SD*=5.88 75.9%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986)	RSQ RQ	MPS	BDI DEQ	*Maladaptive perfectionism* - Socially prescribed perfectionism - Self-Oriented perfectionism	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Riggs et al. (2009) US	317	M_{age}=21.01, *SD*=3.65 66%	CS	SEM	RSQ	STAI-T RSE	CES-D	- Chronic Anxiety	**6**
Roberts et al. (1996) US	255	M_{age}=20.3, *SD*=5.1 62.8%	LO	Multiple regression	AAS	DAttS RSE	IDD	- Dysfunctional attitudes - Self-esteem	**4**
Roelofs et al. (2011) Netherlands	222	M_{age}=14.7, *SD*=1.6 62.1%	CS	Regression analysis Bootstrapping	IPPA	YSQ	BDI-II	- Early maladaptive schemas	**5**
Rosen Marsh (2013) UK Thesis	356	M_{age}=34.4, *SD*=10.9 77.3%	CS	Multiple mediation bootstrapping analyses PROCESS	ECR-S	SCS-SF FSCRS RRS	CESD-SF	- Self-criticism - Self-compassion - Brooding rumination - Hated self-criticism	**6**
Rosenthal et al. (2014) UK	104	20–30 years old 68.3%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Bootstrapping	ECRRS-partner subscale	Group identification	BDI	- Group identification	**6**
Ruitjen et al. (2011) Netherlands	455	M_{age}=14.3, *SD*=1.3 55.8%	CS	Bootstrapping	IPPA	RRS	BDI-II	*Cognitive hyperactivating coping strategies* - Rumination	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Safford et al. (2004) US	167	M_{age}=18.64, *SD*=2.32 65.3%	CS	Hierarchical regression analysis	PBI IPPA AORI RAAS	CSQ	MASQ BDI	*Dysfunctional attitudes* - Cognitive style	**5**
Şenkal & Işikli (2015) Turkey	417	*M*=19.9, *SD*=2.1 76.3%	CS	Hierarchical Regression Analysis Sobel test	ECR-R	TAS-20	BDI	- Alexithymia	**5**
Shaver et al. (2005) US	122	M_{age}=20 *Range* = 17-28 50%	CS	Hierarchical Regression Analyses	ECR	ERSS PRQC	CES-D	*Relational satisfaction* - Perceived relationship quality	**4**
Shochet et al. (2008) Australia	153	M_{age}=15.2, *SD*=1.48 50.3%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	PAQ	PSSM	CDI	- School connectedness	**5**
Silverman (2003) Canada Thesis	451	M_{age}=16.02, *SD*=1.39 61%	LO	SEM	RSQ RQ	PSS SSFI	BDI-II CES-D	- Perceived social support	**7**
Smagur (2018) US Thesis	301	M_{age}=19.52, *SD* = 1.24 100%	CS	SEM	ECR	SST	CES-D	*Dysfunctional attitudes* -Negative interpretation bias	**7**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Smojver-Azic et al. (2015) Croatia	219	M_{age}=19.02, *SD*=1.14 65.29%	CS	Hierarchical Regression Analysis	ECR-I	BPNS Scale - general version (croatian version) SACQ- emotional adjustment subscale	BDI-II	- Emotional adjustment - Psychological needs	**5**
Sudol (2005) US Thesis	206	M_{age}=25.4, *SD*=8.3	CS	SEM	ECR	BSRI	BDI-II CES-D	- Agency - Nurturance	**5**
Sutin & Gillath (2009) US	Study 1 454	Study 1 M_{age}=19.69, *SD*=1.66 64%	CS	Bootstrapping Sobel test	ECR	Sef-defining memory questions	MASQ	- Memory coherence - Emotional intensity - Negative affective content of memory	**5**
	Study 2 534	Study 2 M_{age}=19.3, *SD*=2.1 62%							
Suzuki & Tomoda (2015) Japan	342	M_{age}=13.5, *SD*=2.4 56.4%	CS	SEM	IWMQ	RSE	BDSRS-C	- Low self-esteem	**7**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Vahedi et al. (2016) Iran	285	*Mage*=23.60, *SD*=1.43 Range=22-26 64%	CS	SEM	AAS	CERQ	DASS	*Cognitive hyperactivating coping strategies* - Positive cognitive emotion regulation - Negative cognitive emotion regulation	**5**
Valikhani et al. (2018) Iran	400	M_{age}=24.75, *SD*=3.74 49.75%	CS	PROCESS Bootstrapping	AAS-R	ISK; MAAS; SCoS; SCS-SF	DASS	*Cognitive hyperactivating coping strategies* - Self-knowledge - Self-control - Self-compassion - Mindfulness	**5**
Van de Walle et al. (2016) Belgium	Study 1 390 children	Study 1 M_{age}=11.25, *SD*=0.65 53%	CS	PROCESS Bootstrapping	ECR-RC	CRSQ-ext-Brooding subscale PTMQ	CDI CBCL Withdrawn-Depressed scale	*Cognitive hyperactivating coping strategies* - Repetitive thinking about negative affect	**7**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
	Study 2 157 children	Study 2 M_{age}=10.91, *SD*=0.87 52%					EATQ-R	- Repetitive thinking about negative affect - Repetitive thinking about mother	
Wang (2007) US Thesis	480	M_{age}=16.81, *SD*=0.91 50%	CS	SEM	RSQ-C	DFPS	CHI-A SAED-R ADS	- Piety	**6**
Webster (2000) **US Thesis**	163	M_{age}=14.41, *SD*=0.57 52.15%	CS	Regression analysis	PAQ	SSSC	CDI	- Perceived Social Support	**3**
Wei et al. (2003) **US**	515	M_{age}=18.93, *SD*=2.26 68%	CS	SEM Sobel test	AAS	PF-SOC	BDI	- Deactivating coping strategies - Behavioral hyperactivating coping strategies - Cognitive hyperactivating coping strategies	**5**
Wei et al. (2004)	310	M_{age}=19.27, *SD*=1.88 73%	CS	SEM Bootstrap Sobel test	ECR-S	APS-R FMPS	BHS BDI	- Maladaptive perfectionism	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Wei et al. (2005b)	425	M_{age}=19.38, *SD*=1.59 61%	CS	SEM Bootstrap	ECR-S	BFNE FSRQ RMLAM	CES-D SRDS	*Dependence* - Need for reassurance from others - Self-reinforcement	**5**
Wei et al. (2005c)	308	M_{age}=18.31, *SD*=0.47 59%	LO	SEM Bootstrap	ECR-S	DDI UCLA-3	CES-D	- Social self-efficacy - Self-disclosure - Loneliness	**5**
Wei et al. (2005a)	299	M_{age}=19.73, *SD*=2.92 68%	CS	SEM Bootstrap	ECR-S	BPNS PFQ UCLA-3	CES-D SRDS DASS	- Basic psychological needs satisfaction	**4**
Wei et al. (2006)	372	M_{age}=20.01, *SD*=1.07 59%	LO	SEM Bootstrap	ECR-S	APS-R FMPS	CES-D	*Cognitive hyperactivating coping strategies* - Ineffective coping - Maladaptive perfectionism	**7**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Wei et al. (2007)	390	M_{age}=19.38, *SD*=1.54 63%	CS	SEM Bootstrap	ECR	SDPS RSE SSE-Social Self-Efficacy subscale	CES-D	- Social-self efficacy - Low self-esteem - Self-defeating patterns	**5**
Wijngaards-de Meij et al. (2007) Neetherland	438	M_{age}=42.2, *SD*=9.1 50%	LO	Multilevel regression analysis	AAS	RISS	ICG SCL-90 (depression subscale)	*Relational satifaction* -Marital satisfaction	**6**
Williams et al (2004) US	291	M_{age}=22.5, *SD*=7.20 71.5%	CS	Multiple regression (Baron & Kenny, 1986) Sobel test	ECR	LMSQ AttSQ	BDI-II BAI	*Dysfunctional attitudes* - Cognitive vulnerabilities	**3**
Ying et al. (2007) US	353	M_{age}=20.23, *SD*=1.77 50.7%	CS	Multiple regression (Baron & Kenny, 1986) Sobel test	IPPA	SOC	CES-D	- Low sense of coherence	**6**
You et al. (2015) US China	Chinese sample 153 American sample 214	M_{age}=20.44, *SD*=1.90 54% M_{age}=19.03, *SD*=1.23 53%	CS	SEM Bootstrap	ECR	SSQ CM	CES-D-10	- Perceived social support - Relational conflict	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Zakalik & Wei (2006) US	234	M_{age}=37, *SD*=13.52 0%	CS	SEM Bootstrap	ECR-S	GALOSI–F PPS ASSIS- PD	CES-D DASS	- Perceived discrimination	**6**
Zhu et al. (2016) US/ China	Chinese sample 363	M_{age}=19.83, *SD*=1.35 63.1%	CS	PROCESS Bootstrap	ECR-S	MSPSS	DASS	- Perceived social support	**6**
	American sample 363	M_{age}=19.83, *SD*=1.35 63.1%							

Note: CS = Cross-sectional; LO = Longitudinal; SEM = Structural Equation Modeling; **Attachment measures:** AAQ = Adolescent Attachment Questionnaire; AAS = Adult Attachment Scale; AAS-R = Adult Attachment Scale; AORI = Attachment and Object Relations Inventory; AQ-S = Attachment Questionnaire-Sort; AQ-C = Attachment Questionnaire for Children; ARSQ = Adolescent Relationship Scale Questionnaire; CAAS = Coach–Athlete Attachment Scale; CASQ-R = Children's Attributional Style Questionnaire-Revised; CPS = Child's Perception of Security; ECR = Experiences in Close Relationships Questionnaire; ECRQ = Experiences in Close Relationships Questionnaire; ECR-R = Experiences in Close Relationships-Revised Questionnaire; ECR-RC = Experiences in Close Relationships Scale-Revised; ECRRS = Experiences in Close Relationships Relationship Structures; ECR-R-GSF = Experiences in Close Relationships-Revised- General Short Form; ECR-S = Experiences in Close Relationship Scale-Short Form; IPPA = Inventory of Parent and Peer Attachment; IPPA-R = Inventory of Parent and Peer Attachment-Revised; IWMQ = Internal Working Models Questionnaire; K-RQ = Korean Version of the Relationship Questionnaire; PAQ = Parental Attachment Questionnaire; PBI = Parental Bonding Instrument; RQ = The Relationships Questionnaire; RSQ = The Relationship Scales Questionnaire; RSQ-C = Relationships structures questionnaire-Chinese. **Mediators measures:** ACSQ = Adolescent Cognitive Style Questionnaire; AES = Assessing emotions scale; ALEQ = Adolescent Life Events Questionnaire; APS-R = Almost Perfection Scale–Revised; ATHS = Adult Trait Hope Scale; AttSQ = Attributional Style Questionnaire; ASC = Adolescent Self-Consciousness Questionnaire; ASCS-R = Adolescent Social Comparison Scale-Revised; ASBS = Adolescent Submissive Behavior Scale; ASPP = Adult Self-Perception Profile; ASSIS-PD = Acculturative Stress Scale for International Student- Perceived Discrimination; BAFL = Beliefs about the Functions of Language Scale; BAI = Beck Anxiety Inventory; BFNE = Brief Fear of Negative Evaluation; BPNS = Basic Psychological Needs Satisfaction Scale; BSRI = Bern Sex Role Inventory; CBQ = Children's Behavior Questionnaire; CCSC = Children's Coping Strategies Checklist; CDAS = Children's Dysfunctional Attitudes Scale; CERQ = Cognitive Emotion Regulation Questionnaire; CESBQ = Children's Expectation of Social Behavior Questionnaire; CM = Conflict Measure; CRBQ = Conflict-Resolution Behavior Questionnaire; RSQ-ext = Children's Response Styles Questionnaire-Extended; CSI = Coping Strategy Indicator ; CSQ = Cognitive Style Questionnaire; CTI = Cognitive Triad Inventory; DDI =

Distress Disclosure Index; DAttS = Dysfunctional Attitudes Scale; DAS = Dyadic Adjustment Scale; DEQ = Depressive Experiences Questionnaire; DEQ-A = Depressive Experiences Questionnaire for Adolescents; DERS = Difficulties in Emotion Regulation Scale; DFPS = Dual Filial Piety Scale; EAQ = Emotional Awareness questionnaire; ERI = Emotion Regulation Inventory; ERQ = Emotion Regulation Questionnaire; ERSS = Excessive Reassurance Seeking Scale; FFMQ = Five Factors Questionnaire Mindfulness; FMPS = Multidimensional Perfectionism Scale; FSCRS = Forms of Self-Criticising/Attacking & Self-Reassuring Scale; FSRQ = Frequency of Self-Reinforcement Questionnaire; FSSS = Fear of Compassion for Self-Scale; GALOSI-F = Gay and Lesbian Oppressive Situations Inventory—Frequency; ICG-R = Inventory of Complicated Grief-Revised; ICQ = Interpersonal Competence Questionnaire; IIP-SC = Inventory of Interpersonal Problems-Short Circumplex Form; IOS Scale = The Inclusion of Other in the Self; IPPA = Inventory of Parent and Peer Attachment; IRRBS = Individual and Relations Role Balance Scale; IRI = Interpersonal Reactivity Index; ISK = Integrative Self-Knowledge Scale; ITQ-FD = Interpersonal Trust Questionnaire- Fear Disclosure; K-RSE = Korean-Rosenberg Self-Esteem Scale; LCS = Locus of Control Scale; LIHS = Lesbian Internalized Homophobia Scale; LSAS-R = Liebowitz Social Anxiety Scale-Self-Report; MAAS = Mindful Attention Awareness Scale; MES = Maternal Efficacy Scale; MPS = The Multidimensional Perfectionism Scale; MRQ = Multidimensional Relationship Questionnaire; MSPSS = Multidimensional Scale of Perceived Social Support; NLEQ = Negative Life Events Questionnaire; PFQ = Personal Feelings Questionnaire; PF-SOC = Problem-Focused Style of Coping; PNTS = Psychological Need Thwarting Scale (PNTS); PPS = Perceived Prejudice Scale; PSI-II = Personal Style Inventory-II; PSS = Perceived Social Support Scale; PSS-Fr = Perceived Social Support –Friends; PSSM = Psychological Sense Of School Membership; PSSQ = Perceived Social Support Questionnaire; PTMQ = Perseverative Thinking about Mother Questionnaire; REQ = Regulation of Emotion Questionnaire; RISS = Relational Interaction Satisfaction Scale; RMLAM = Revised Martin-Larsen Approval Motivation scale; RRQ = Rumiation-Reflecction Questionnaire; RRS = Ruminative Responses Scale; RSE = Rosenberg Self-Esteem Scale; RSS = Relationship Satisfaction Scale; RTQ = Repetitive Thinking Questionnaire ; SACQ = Student Adaptation to College Questionnaire; SBS = Submissive Behavior Scale; SCoS = Self-Control Scale; SDPS = Self-Defeating Personality Scale; SoCS = Social Comparison Scale; SCS = Self-Compassion Scale; SCS-SF = Self-Compassion Scale Short Form; SDQ-II-GSE = Self-Description Questionnaire II, General Self-Esteem; SEQ = Self-Steem Questionnaire; SOC = Sense of Coherence; SPPA = Self-Perception Profile for Adolescents; SPPC = Self-Perception Profile for Children; SSI = Separation-Individuation Inventory; SSPS = Social Safeness and Pleasure Scale; SSQ = Social Support Questionnaire; SSFI = Social Support Functions Inventory; SSSC = Social Support Scale for Children; SST = Scrambled Sentences Test; STAI-II = State Trait Anger Inventory-2 version; TAS-20 = Toronto Alexithymia Scale; TFS = Trait Forgivingness Scale; TI-GT = Trust Inventory Generalized Trust Subscale; UCLA-3 = UCLA Loneliness Scale–Version 3; YSQ = Young Schema Questionnaire. **Outcome measure:** ADS = Adolescent Depression Scale; BDI = Beck depression inventory; BDI-II = Beck Depression Inventory-II; BDSRS-C = Birleson Depression Self-Rating Scale for Children; BHS = Beck Hopelessness Scale; BSI = Symptom Inventory; CBCL = Child Behavior Checklist; CCAPS-62 = Counseling Center Assessment of Psychological Symptoms-62; CES-D = Center for Epidemiological Studies Depression Scale; CESD-R = Center for Epidemiological Studies Depression Scale Revised; CES-D-10 = Center for Epidemiological Studies Depression Scale-10 items; CESD-SF = Center for Epidemiological Studies Depression Short Form; CDI = Children's Depression Inventory; CHI-A = Chinese Happiness Inventory-Adolescent; COPAS = Comprehensive Personality and Affect Scales; DACL = Depression Adjective Checklist, Forms F and G; DASS = Depression Anxiety Stress Scale-short version; DASS-42 = Depression Anxiety Stress Scale; DEQ = Depressive Experiences Questionnaire; DIC-DS = Dominic Interactive Questionnaire- Depression subscale; DID = Diagnostic Inventory of Depression; DISC-YC = Diagnostic Interview Schedule for Children-Parent Scale—Young Child; EATQ-R = The Early Adolescent Temperament Questionnaire-Revised; EPDS = Edinburgh Postnatal Depression Scale; GHQ-28 = General Health Questionnaire-28; ICG = Inventory of Complicated Grief; IDD = Inventory to Diagnose Depression; K-BDI = Korean-Beck Depression Inventory; KDS = Kandel Depressive Symptoms; MASQ= Mood And Anxiety Symptoms Questionnaire; PHQ = Patient Health Questionnaire; RCADS = Revised Child Anxiety and Depression Scale-Short Version; SCL-90 Depression = Symptom Checklist-90; SAED-R = Scale of Assessing Emotional Disturbance-Revised; SRDS = Self-Rating Depression Scale; SRDS = Zung Self-Rating Depression Scale.

Table 13. Quality assessment of the included studies

	Aim clear	Design appro-priate to aim	Sample repre-sentative	Psycho-metric characteristics	Accepta-ble methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control Con-founding factors	Final Rating
Aderka et al. (2009)	1	1	0	1	1	0	0	1	0	**5**
Altin & Terzi (2010)	1	1	0	1	0	0	0	1	0	**4**
Besser & Priel (2008)	1	1	1	0	0	0	0	1	1	**5**
Beyderman & Young (2016)	1	1	0	1	1	0	0	1	0	**5**
Bishop et al. (2018)	1	1	0	1	1	0	0	1	1	**6**
Boo (2010) Thesis	1	1	0	1	1	0	0	1	0	**5**
Bosacki et al. (2007)	1	1	1	1	0	0	0	1	1	**6**
Bozanoglu et al. (2017)	1	1	0	1	1	0	0	1	0	**5**
Brenning et al. (2012)	1	1	0	1	1	0	0	1	0	**5**
Burnette et al. (2009)	1	1	0	0	1	0	0	0	0	**3**
Cantazaro & Wei (2010)	1	1	0	1	1	0	0	1	0	**5**
Chaowiang (2008) Thesis	1	1	0	1	0	0	0	1	1	**5**
Chen et al. (2018)	1	1	1	1	1	0	0	1	1	**7**
Clout & Brown (2016)	1	1	1	1	0	0	0	1	1	**6**
Chikuan & Bond (2010)	1	1	0	0	1	0	0	1	1	**5**
Cohen et al. (2013)	1	1	1	1	1	0	0	1	1	**7**
Cooley et al. (2010)	1	1	0	1	0	0	0	1	0	**4**
Cooper-Newark (2015) Thesis	1	1	0	1	1	0	0	1	0	**5**
Cruddas et al. (2012)	0	1	0	1	0	0	0	1	0	**3**
Dagnino et al. (2017)	1	1	0	1	1	0	0	1	0	**5**
Eberhart & Hammen (2010)	1	1	0	1	1	0	0	1	1	**6**
Farinelli & Guerrero (2011)	1	1	0	1	0	0	0	1	0	**4**
Felton & Jowett (2015)	1	1	0	1	1	0	0	1	0	**5**
Gaylord-Harden et al. (2009)	1	1	0	1	1	0	0	1	1	**6**
Gnilka et al. (2013)	1	1	0	1	1	0	0	1	0	**5**
Graham (2018) UK Thesis	1	1	0	1	1	0	0	1	0	**5**

	Aim clear	Design appro-priate to aim	Sample repre-sentati ve	Psycho -metric charac teristic s	Accepta-ble methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control Con-founding factors	Final Rating
Gülüm & Dag (2013)	1	1	0	1	0	0	0	0	0	**3**
Halpern et al. (2012)	0	1	0	1	0	0	0	0	0	**2**
Han & Lee (2011)	0	1	0	1	0	0	0	1	1	**4**
Hankin et al. (2005)	1	1	0	1	1	0	0	1	1	**6**
Hopkins et al. (2019)	1	1	1	1	1	1	1	1	1	**9**
Irons & Gilbert (2005)	1	1	0	1	0	0	0	1	0	**4**
Joeng et al. (2017)	1	1	0	1	1	0	0	1	0	**5**
Kamkar et al. (2012)	1	1	0	1	0	0	0	1	1	**5**
Kang et al. (2014)	1	1	0	1	0	0	0	1	1	**5**
Keleher et al. (2010)	1	1	0	1	1	0	0	1	0	**5**
Kenney (2006) Thesis	1	1	1	1	0	0	0	0	1	**5**
Kenny et al. (1993)	1	1	0	1	1	0	0	1	0	**5**
Kenny & Sirin (2006)	1	1	0	1	0	0	0	1	1	**5**
Kidd & Sheffield (2005)	1	1	0	0	0	0	0	1	0	**3**
Korolly (2017) Thesis	1	1	0	1	1	0	0	1	1	**6**
Kullik & Petermann (2013)	1	1	0	1	1	0	0	1	1	**6**
Land (2012) Thesis	1	1	0	1	0	0	0	1	0	**4**
Leal (2018) Thesis	1	1	0	1	1	0	0	1	0	**5**
Lecompte et al. (2014)	1	1	0	1	1	0	0	1	1	**6**
Lee & Hankin (2009)	1	1	1	1	1	1	0	1	1	**8**
Lee & Koo (2015)	1	1	0	1	1	0	0	1	0	**5**
Li et al. (2015)	1	1	0	1	1	0	0	1	1	**6**
Linares et al. (2016)	1	1	0	1	1	0	0	1	1	**6**
Lindsay (2007) Thesis	1	1	0	1	1	0	0	1	0	**5**
Liu (2006)	0	1	1	1	1	0	0	1	0	**5**
Lopez et al. (2001)	1	1	0	1	0	0	0	1	1	**5**
Love & Murdock (2012)	1	1	0	1	1	0	0	1	0	**5**

	Aim clear	Design appro-priate to aim	Sample repre-sentative	Psycho-metric characteristics	Accepta-ble methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control Con-founding factors	Final Rating
Marchand-Reilly (2009)	1	1	0	1	0	0	0	1	0	**4**
Marganska et al. (2013)	1	1	0	1	1	0	0	1	0	**5**
Margolese et al. (2005)	1	1	0	1	0	0	0	1	1	**5**
Marks et al. (2016)	1	1	0	1	1	0	0	1	0	**5**
Martin (2001) Thesis	1	1	1	1	0	0	0	1	1	**6**
Martin (2008) Thesis	1	1	1	1	0	0	0	1	0	**5**
McDermott et al. (2015)	1	1	1	1	1	0	0	1	0	**6**
Mendes (2019)	0	1	0	0	1	0	0	1	0	**3**
Merlo (2005) Thesis	1	1	0	1	1	0	0	1	0	**5**
Milne & Greenway (2007)	1	1	0	0	1	0	0	0	0	**3**
Mohammadkhani et al. (2018)	1	1	0	0	1	0	0	0	0	**3**
Monti & Rudolph (2014)	1	1	0	1	1	1	1	1	0	**7**
Ng & Hou (2017)	1	1	0	1	1	0	0	1	0	**5**
Nichols (2005) Thesis	1	1	1	1	0	0	0	1	0	**5**
Owens et al. (2018)	1	1	1	1	1	0	0	1	0	**6**
Paech et al. (2015)	0	1	1	1	1	0	0	1	0	**5**
Permuy et al. (2010)	1	1	0	1	0	0	0	1	0	**4**
Pickard et al. (2016)	1	1	0	1	1	0	0	1	0	**5**
Puissant et al. (2011)	1	1	0	0	0	0	0	1	1	**4**
Reinecke & Rogers (2001)	1	1	1	1	0	0	0	1	0	**5**
Reis & Grenyer (2002)	1	1	0	1	0	0	0	1	1	**5**
Riggs et al. (2009)	1	1	0	1	1	0	0	1	1	**6**
Roberts et al. (1996)	1	1	0	1	0	0	0	1	0	**4**
Roelofs et al. (2011)	1	1	1	0	1	0	0	1	0	**5**
Rosen Marsh (2013) Thesis	1	1	1	1	1	0	0	1	0	**6**
Rosenthal et al. (2014)	1	1	1	1	1	0	0	1	0	**6**
Ruitjen et al. (2011)	1	1	1	1	1	0	0	1	0	**6**

	Aim clear	Design appro-priate to aim	Sample repre-sentati ve	Psycho -metric charac teristic s	Accepta-ble methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control Con-founding factors	Final Rating
Safford et al. (2004)	1	1	1	1	0	0	0	0	1	**5**
Şenkal & Işikli (2015)	1	1	1	1	0	0	0	1	0	**5**
Shaver et al. (2005)	1	1	1	0	0	0	0	1	0	**4**
Shochet et al. (2008)	1	1	1	1	0	0	0	1	0	**5**
Silverman (2003) Thesis	1	1	1	1	1	0	0	1	1	**7**
Smagur (2018) Thesis	1	1	1	1	1	0	0	1	1	**7**
Smojver-Azic et al. (2015)	1	1	1	1	0	0	0	1	0	**5**
Sudol (2005) Thesis	1	1	0	1	1	0	0	1	0	**5**
Sutin & Gillath (2009)	1	1	0	1	1	0	0	1	0	**5**
Suzuki & Tomoda (2015)	1	1	1	1	1	0	0	1	1	**7**
Vahedi et al. (2016)	1	1	0	1	1	0	0	1	0	**5**
Valikhani et al. (2018)	1	1	0	1	1	0	0	1	0	**5**
Van de Walle et al. (2016)	1	1	1	1	1	0	0	1	1	**7**
Wang (2007) Thesis	1	1	1	1	1	0	0	1	0	**6**
Webster (2000) Thesis	1	0	0	1	0	0	0	1	0	**3**
Wei et al. (2003)	1	1	0	1	1	0	0	1	0	**5**
Wei et al. (2004)	1	1	0	1	1	0	0	1	0	**5**
Wei et al. (2005b	1	1	0	1	1	0	0	1	0	**5**
Wei et al. (2005c)	1	1	0	1	1	0	0	1	0	**5**
Wei et al. (2005a)	1	1	0	1	1	1	1	1	0	**4**
Wei et al. (2006)	1	1	0	1	1	1	1	1	0	**7**
Wei et al. (2007)	1	1	0	1	1	0	0	1	0	**5**
Wijngaardsde et al. (2007)	1	1	1	1	0	0	0	1	1	**6**
Williams et al (2004)	1	1	0	0	0	0	0	1	0	**3**
Ying et al. (2007)	1	1	1	1	0	0	0	1	1	**6**
You et al. (2015)	1	1	1	1	1	0	0	1	0	**6**
Zakalik & Wei (2006)	1	1	1	1	1	0	0	1	0	**6**

	Aim clear	Design appro-priate to aim	Sample repre-sentative	Psycho-metric characteristics	Accepta-ble methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control Con-founding factors	Final Rating
Zhu et al. (2016)	1	1	0	1	1	0	0	1	1	**6**

Meta-analysis

The pooled correlation coefficients for path a, path b, total effect and indirect effect, with their CIs, the I^2 statistic and effect sizes of each mediation model (mediation ratio) are presented in Table 14. Please, find detailed extracted and coded data for meta-analysis in Appendix 12.

Primary analyses

Overall, 38% of the total effect of insecure attachment on depressive symptoms was explained by the indirect effect of the main mediating variables. Heterogeneity was substantial overall and similarly high after stratification by sample, type of attachment, age, quality or gender. No individual study seemed to represent an influential point that increased heterogeneity dramatically. We, therefore, focused on the random effects analyses as recommended by experts.

Comparing sample types, in clinical samples the percentage of the total effect explained by the indirect effect was larger (81%) than in non-clinical samples (31%). Regarding attachment style, the percentage of the total effect explained by the indirect effect was 30% with anxious attachment and 36% with avoidant attachment. The effect size of the mediating variables was not significant among children/adolescents, while among adults was significant and the percentage of the total effect explained by the indirect effect was 35%. Additionally, the effect size of the mediating variables was not significant when differing by gender.

Subgroup analysis by mediators

Cognitive domain

Dysfunctional attitudes

A total of five empirical studies (Hankin et al., 2005; Reinecke & Rogers, 2001; Roberts et al., 1996; Safford et al., 2004; Williams & Risking, 2004) and two doctoral dissertations (Martin, 2001; Smagur, 2018) examined the mediational effect of dysfunctional attitudes

among adults. Based on this evidence, the pooled estimate of the indirect effect of dysfunctional attitudes was significant. The percentage of the total effect explained by the indirect effect was 40%; heterogeneity was high-moderate for the indirect effect (I^2 = 53%) and high for the total effect (I^2 = 97%). Three empirical studies (Kamkar et al., 2012; Lee & Hankin, 2009; Margolese et al., 2005) and one doctoral dissertation (Chaowiang, 2008) assessed dysfunctional attitudes as a mediator among children and adolescents, but the indirect effect was not significant. Heterogeneity was high-moderate for the indirect effect (I^2 = 60%) and high for the total effect (I^2 = 94%).

Low self-esteem

Seven empirical studies (Hankin et al., 2005; Kang et al., 2014; Kenny & Sirin, 2006; Lee & Koo, 2015; Love & Murdock, 2012; Roberts et al., 1996; Wei & Ku, 2007) and one doctoral dissertation (Boo, 2010) assessed the indirect effect of low self-esteem with adults and theindirect effect was not significant. Heterogeneity was high for both the indirect effect (I^2 = 96%) and the total effect (I^2 = 97%). Among children/adolescents, the indirect effect was not significant based on the results of six empirical studies (Bosacki et al., 2007; Kamkar et al., 2012; Kenny et al., 1993; Lecompte et al., 2014; Lee & Hankin, 2009; Suzuki & Tomoda, 2015) and two doctoral dissertations (Graham, 2018; Kenney, 2006). Heterogeneity was high for both the indirect effect (I^2 = 94%) and the total effect (I^2 = 98%).

Maladaptive perfectionism

Based on the results of four studies with adults the indirect effect of this mediator (Gnilka et al., 2013; Reis & Grenyer, 2002; Wei et al., 2004; Wei et al., 2006), was not significant; heterogeneity was high-moderate for both the indirect effect (I^2 = 55%) and the total effect (I^2 = 66%). There were no studies with children/adolescents.

Self-criticism

The pooled estimate of the indirect effect of self-criticism was significant based on the results of three empirical studies (Cantazaro

& Wei, 2010; Dagnino et al., 2017; Permuy et al., 2010) and one doctoral dissertation (Rosen Marsh, 2013) with adults. The percentage of the total effect explained by the indirect effect was 57%; there was no heterogeneity. No study evaluated this model in children/adolescents.

Self-compassion

The indirect effect of this variable, taking into account the results of two empirical studies (Joeng et al., 2017; Valikhani et al., 2018) and one doctoral dissertation (Rosen Marsch, 2013) with adults, was significant. The percentage of the total effect explained by the indirect effect was 41%; there was no heterogeneity. Among children/adolescents, the pooled estimate of the indirect effect was not significant (Graham, 2018).

Low sense of coherence

The indirect effect of low sense of coherence was not significant with adults (Han & Lee, 2011; Ying et al., 2007); heterogeneity was low-moderate for the total effect (I^2 = 45%) and none for the indirect effect. There were no studies with children/adolescents.

Dependence

The pooled estimate for the indirect effect of dependence based on the results of six studies (Altin & Terzi, 2010; Besser & Priel, 2008; Cantazaro & Wei, 2010; Dagnino et al., 2017; Permuy et al., 2010; Wei et al., 2005) and one doctoral dissertation (Koroly, 2017) with adults yielded not significant effects. Heterogeneity was high for both the indirect effect (I^2 = 80%) and the total effect (I^2 = 90%). Two studies among children/adolescents (Irons & Gilbert, 2005; Puissant et al., 2011), also did not achieve a significant indirect effect e a significant effect. Heterogeneity was low-moderate for the indirect effect (I^2 = 31%) and high for the the total effect (I^2 = 97%).

Self-disclosure

Only two studies with adults assessed the indirect effect of self-diclosure (Cruddas et al., 2012; Wei et al., 2005) and the indirect

effect estimated was not significant. Heterogeneity was high for the indirect effect (I^2 = 93%) and for the the total effect (I^2 = 93%). No studies tested this model with children/adolescents.

Emotional domain

Emotional dysregulation

The indirect effect of emotional dysregulation was not significant in adults (Clout & Brown, 2016; Marganska et al., 2013; Owens et al., 2018; Pickard et al., 2016). Heterogeneity was low for the indirect effect (I^2 = 14%) and high for the total effect (I^2 = 76%). Among children/adolescents (Brenning et al., 2012; Chen et al., 2019), was also not significant. Heterogeneity was high for both the indirect effect (I^2 = 94%) and the total effect (I^2 = 99%).

Alexithimia

The results of three studies with adults assessing alexithymia (Monti & Rudolph, 2014; Owens et al., 2018; Şenkal & Işıklı, 2015), showed that its indirect effect was not significant. Heterogeneity was high for the total effect (I^2 = 89%) and none for the the indirect effect. No studies tested this model with children/adolescents.

Coping strategies

The pooled estimate for the indirect effect of behavioral hyperactivating strategies measured in two empirical studies was not significant in studies with adults (Cooley et al., 2010; Wei et al., 2003). Heterogeneity was high for the total effect (I^2 = 97%) and none for the total effect. Among children/adolescents, two empirical studies (Gaylord-Harden et al., 2009; Kullik & Petermann, 2013) and one doctoral dissertation (Merlo, 2005) tested behavioral hyperactivating strategies as mediator but it was not significant either. Heterogeneity was low for the indirect effect (I^2 = 23%) and high for the total effect (I^2 = 98%).

Nine empirical studies with adults (Beyderman & Young, 2016; Burnette et al., 2009; Gülüm & Dağ, 2014; Lopez et al., 2001; Mohammadkhani et al., 2017; Vahedi et al., 2016; Valikhani et al.,

2018; Wei et al., 2003, 2006) and two doctoral dissertations (Land, 2012; Rosen Marsh, 2013) measured cognitive hyperactivating strategies and its indirect effect was significant. The percentage of the total effect that was explained by the indirect effect was 33%; heterogeneity was low-moderate for the indirect effect (I^2 = 36%) and high for the total effect (I^2 = 90%). In contrast, gathering the results of six empirical studies among children/adolescents (Chen et al., 2019; Kullik & Petermann, 2013; Li et al., 2015; Margolese et al., 2005; Ruijten et al., 2011; Van de Walle et al., 2016) and one doctoral dissertation (Lindsay, 2007), the indirect effect was not significant. Heterogeneity was low-moderate for the indirect effect (I^2 = 26%) and high for the total effect (I^2 = 97%).

The indirect effect of deactivating strategies was not significant based on the evidence of two empirical studies with adults (Lopez et al., 2001; Wei et al., 2003). There was no heterogeneity. Among children/adolescents, only one study tested this model (Gaylord-Harden et al., 2009) and the pooled estimate of the indirect effect was not significant.

Repetitive thinking

Build on four empirical studies (Beyderman & Young, 2016; Burnette et al., 2009; Gülüm & Dag, 2014; Mohammadkhani et al., 2017) and two doctoral dissertations (Land, 2012; Rosen Marsh, 2013) with adults, the indirect effect of repetitive thinking was significant in studies with adults. The percentage of the total effect that was explained by the indirect effect was 45%; heterogeneity was high-moderate for the total effect (I^2 = 72%) and none for the indirect effect. Among children/adolescents (Lindsay, 2007; Margolese et al., 2005; Ruijten et al., 2011; Van de Walle et al., 2016), the indirect effect was not significant. Heterogeneity was high for the total effect (I^2 = 88%) and none for the indirect effect.

Rumination

Only two studies with children/adolescents assessed rumination (Margolese et al., 2005; Ruijten et al., 2011) and its indirect effect estimated was not significant. Heterogeneity was low for the total

effect (I^2 = 2%) and none for the indirect effect. No studies tested this model with adults.

Brooding rumination

The pooled estimate for the indirect effect of brooding rumination was significant in studies with adults (Beyderman & Young, 2016; Land, 2012; Mohammadkhani et al., 2017; Rosen Marsh, 2013). The percentage of the total effect that was explained by the indirect effect was 53%; there was no heterogeneity. Among children/adolescents, the indirect effect was not significant. Only one doctoral dissertation tested this model in children/adolescents (Lindsay, 2007).

Reflection rumination

The indirect effect calculated for reflection rumination was not significant in either adults (Burnette et al., 2009) or children/adolescents (Lindsay, 2007). In total, no significant indirect effect was found. Heterogeneity was high-moderate for the indirect effect (I^2 = 71%) and high for the total effect (I^2 = 98%).

Self-control

The indirect effect estimated was not significant neither among adults (Valikhani et al., 2018) or children/adolescents (Li et al., 2015). In total, no significant indirect effect was found. Heterogeneity was low-moderate for the total effect (I^2 = 45%) and none for the indirect effect.

Interpersonal domain

Perceived social support

The indirect effect estimated for this mediator was not significant in studies with adults (Keleher et al., 2010; Kuan Mak et al., 2010; You et al., 2015; Zhu et al., 2016). Heterogeneity was low-moderate for the total effect (I^2 = 47%) and none for the indirect effect. Two doctoral dissertations (Silverman, 2003; Webster, 2000) and one empirical study (Liu, 2006) tested this model among children/adolescents and the indirect effect was not significant.

Heterogeneity was high for both the indirect effect (I^2 = 94%) and the total effect (I^2 = 98%).

Relational satisfaction

Based on the results of six studies with adults (Altin & Terzi, 2010; Clout & Brown, 2016; Kuan Mak et al., 2010; Paech et al., 2016; Shaver et al., 2005; Wijngaards-de Meij et al., 2007), the indirect effect of this mediator was not significant. Heterogeneity was high for the total effect (I^2 = 89%) and none for the the indirect effect. No studies tested this model with children/adolescents.

Relational conflict

The indirect effect of relational conflict was not significant in studies with adults (Eberhart & Hammen, 2010; You et al., 2015). There was no heterogeneity. No studies tested this model with children/adolescents.

Social comparison

Two studies with children/adolescents assessed social comparison as a mediator (Irons & Gilbert, 2005; Puissant et al., 2011) and they found that its indirect effect was not significant. There was no heterogeneity. No studies tested this model with adults.

Social self-efficacy

A total of three empirical studies (Paech et al., 2016; Wei & Ku, 2007; Wei et al., 2005) and one doctoral dissertation (Leal, 2018) with adults tested social self-efficacy as a mediator; and its indirect effect estimated was not significant. There was no heterogeneity. No studies tested this model with children/adolescents.

Interpersonal stressors

The indirect effect of interpersonal stressors was not significant neither in adults (Hankin et al., 2005) or children/adolescents (Cohen et al., 2013). In total, no significant indirect effect was found. Heterogeneity was low-moderate for the total effect (I^2 = 43%) and none for the indirect effect.

Table 14. Random effects pooled correlation coefficients of path a, path b, indirect effect and total effect; heterogeneity and mediation ratio

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Total	141	0.07 (0.02-0.12)	0.97	0.05(-0.01-0.11)	0.97	0.16 (0.11-0.21)	0.97	0.06 (0.04-0.08)	0.81	0.38
Clinical sample	7	0.46(0.27 -0.62)	0.70	0.13 -0.15 0.39	0.91	0.16 (-0.07-0.37)	0.88	0.13 (0.01-0.24)	0.09	0.81
Non clinical sample	134	0.05 0.01 0.10	0.97	0.05 -0.02 0.11	0.98	0.16 (0.11-0.21)	0.97	0.05 (0.03-0.07)	0.81	0.31
Anxious	74	0.09 (0.01-0.16)	0.97	0.08 (-0.01-0.18)	0.98	0.37 (0.34-0.40)	0.76	0.11 (0.09-0.13)	0.57	0.30
Avoidant	64	-0.02 (-0.10-0.07)	0.97	0.03 (-0.07-0.13)	0.98	0.25 (0.22-0.28)	0.82	0.09 (0.07-0.12)	0.50	0.36
Children/ adolescents	48	0.03 (-0.05-0.11)	0.97	-0.01(-0.09-0.08)	0.98	-0.03 (-0.10-0.04)	0.97	0.01 (-0.03-0.04)	0.80	0.33
Adults	93	0.09 (0.03-0.15)	0.97	0.08 (-0.01-0.17)	0.98	0.26 (0.21-0.30)	0.92	0.09 (0.06-0.11)	0.73	0.35
High quality	53	0.07 (-0.01-0.14)	0.97	0.06 (-0.04-0.16)	0.98	0.17 (0.10-0.25)	0.98	0.06 (0.03-0.09)	0.72	0.35
Low quality	88	0.07 (0.01-0.13)	0.97	0.04 (-0.03-0.12)	0.98	0.15 (0.09-0.21)	0.96	0.06 (0.03-0.08)	0.84	0.40
Males	7	0.11 (-0.13-0.34)	0.97	0.25 (-0.40-0.74)	0.99	-0.01(-0.32-0.31)	0.98	-0.01(-0.16-0.14)	0.92	1.00
Females	18	0.06 (-0.09-0.21)	0.97	0.05 (-0.36-0.45)	0.99	0.07 (-0.13-0.27)	0.98	0.01 (-0.08-0.11)	0.91	0.14
Dysfunctional attitudes	11	0.21 (0.05-0.35)	0.98	0.33 (0.19-0.46)	0.98	0.17 (-0.01-0.33)	0.97	0.07 (-0.01-0.14)	0.67	0.41
Children/ adolescents	4	0.01 (-0.23-0.22)	0.98	0.30 (0.11-0.47)	0.80	0.04 (-0.21-0.28)	0.94	0.01 (-0.10-0.11)	0.60	0.25
Adults	7	0.33 (0.12-0.51)	0.94	0.34 (0.16-0.50)	0.31	0.25(0.08-0.39)	0.97	0.10 (0.01-0.20)	0.53	0.40
Low self-esteem	16	0.06 (-0.07-0.19)	0.98	-0.55 (-0.63--0.46)	0.70	0.01 (-0.14-0.15)	0.98	-0.03 (-0.09-0.03)	0.95	3.00
Children/ adolescents	8	0.05 (-0.12-0.21)	0.98	-0.52 (-0.62--0.40)	0.97	0.03 (-0.15-0.21)	0.98	-0.05 (-0.13-0.03)	0.94	1.67
Adults	8	0.07 (-0.13-0.27)	0.99	-0.58 (-0.69--0.46)	0.80	-0.01 (-0.16-0.15)	0.97	-0.02 (-0.11-0.07)	0.96	2.00
Maladaptive perfectionism	4	0.27 (0.02-0.49)	0.80	0.37 (0.14-0.56)	0.90	0.34 (0.07-0.57)	0.66	0.11 (-0.01-0.23)	0.55	0.32
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	4	0.27 (0.02-0.49)	0.80	0.37 (0.14-0.56)	0.90	0.34 (0.07-0.57)	0.66	0.11 (-0.01-0.23)	0.55	0.32
Self-criticism	4	0.38 (0.14-0.58)	0.98	0.46 (0.25-0.64)	0.43	0.30 (0.02-0.54)	0	0.17 (0.04-0.28)	0	0.57

	N° of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Children/ adolescents	0	--	--	--	--	--	--	--	--	
Adults	4	0.38 (0.14-0.58)	0.98	0.46 (0.25-0.64)	0.43	0.30 (0.02-0.54)	0	0.17 (0.04-0.28)	0	0.57
Self-compassion	4	-0.26 (-0.49 --0.01)	0.90	-0.47 (-0.64--0.25)	0.71	0.23 (-0.06-0.48)	0.93	0.13 (0.01-0.24)	0	0.57
Children/ adolescents	1	0.15 (-0.35-0.58)	--	-0.51 (-0.77--0.09)	--	-0.39 (-0.75-0.14)	--	-0.08 (-0.39-0.24)	--	0.21
Adults	3	-0.36 (-0.61--0.06)	0.87	-0.45 (-0.65--0.20)	0.85	0.39 (0.16-0.57)		0.16 (0.02-0.29)	0	0.41
Low sense of coherence	2	0.21 (-0.16-0.53)	0	-0.47 (-0.70--0.16)	0.99	-0.26 (-0.59-0.15)	0.45	-0.10 (-0.28-0.09)	0	0.38
Children/ adolescents	0	--	--	--	--	--	--	--	--	
Adults	2	0.21 (-0.16-0.53)	0	-0.47 (-0.70--0.16)	0.99	-0.26 (-0.59-0.15)	0.45	-0.10 (-0.28-0.09)	0	0.38
Over-dependence	9	0.04 (-0.13-0.21)	0.96	0.10 (-0.07--0.26)	0	0.15 (-0.05-0.33)	0.96	0.04 (-0.05-0.12)	0.80	0.27
Children/ adolescents	2	-0.10 (-0.40-0.22)	0.93	0.24 (0.04-0.49)	0.92	-0.22 (-0.52-0.14)	0.97	-0.06 (-0.22-0.10)	0.31	0.27
Adults	7	0.08 (-0.14-0.29)	0.97	0.06 (-0.14-0.24)	0.98	0.25 (0.09-0.40)	0.90	0.07 (-0.03-0.17)	0.80	0.28
Self-disclosure	2	-0.48 (-0.71--0.14)	0.94	0.14 (-0.21-0.46)	0.71	-0.04 (-0.42-0.36)	0.93	-0.10 (-0.27-0.08)	0.93	2.50
Children/ adolescents	0	--	--	--	--	--	--	--	--	
Adults	2	-0.48 (-0.71 - -0.14)	0.94	0.14 (-0.21-0.46)	0.71	-0.04 (-0.42-0.36)	0.93	-0.10 (-0.27-0.08)	0.93	2.50
Emotional dysregulation	6	0.05 (-0.16-0.26)	0.97	0.36 (-0.17-0.52)	0.99	0.13 (-0.10-0.35)	0.99	0.09 (-0.01-0.18)	0.80	0.69
Children/ adolescents	2	0.12 (-0.18-0.41)	0.99	0.18 (-0.09-0.43)	0	-0.02 -0.35 0.31	0.99	0.07 (-0.06-0.20)	0.94	3.50
Adults	4	0.01 (-0.27-0.29)	0.92	0.45 (0.22-0.62)	0.97	0.21 -0.01 0.40	0.76	0.10 (-0.03-0.22)	0.14	0.48
Alexithimia	3	0.16 (-0.13-0.43)	0.96	0.07 (-0.20--0.34)	0	0.21 (-0.12-0.49)	0.89	0.07 (-0.06-0.19)	0	0.33
Children/	0	--	--	--	--	--	--	--	--	

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
adolescents										
Adults	3	0.16 (-0.13-0.43)	0.96	0.07 (-0.20--0.34)	0	0.21 (-0.12-0.49)	0.89	0.07 (-0.06-0.19)	0	0.33
COPING: Behavioral hyperactivating strategies	5	0.02 (-0.21-0.25)	0.93	-0.02 (-0.23-0.20)	0.71	-0.01 (-0.26-0.25)	0.98	0.02 (-0.09-0.13)	0	2.00
Children/ adolescents	3	-0.13 (-0.37-0.13)	0.95	-0.07 (-0.30-0.16)	0.89	0.01 (-0.28-0.29)	0.98	0.02 (-0.11-0.15)	0.23	2.00
Adults	2	0.24 (-0.16-0.58)	0	0.06 (-0.29-0.40)	0.95	-0.01 (-0.31-0.29)	0.97	0.02 (-0.16-0.20)	0	2.00
COPING: Cognitive hyperactivating strategies	20	0.14 (0.03-0.25)	0.95	0.24 (0.13-0.34)	0.99	0.18 (0.06-0.30)	0.98	0.06 (0.01-0.11)	0.72	0.33
Children/ adolescents	9	0.10 (-0.05-0.24)	0.85	0.15 (0.02-0.27)	0.98	-0.10 (-0.26-0.06)	0.97	-0.01 (-0.08-0.06)	0.26	0.10
Adults	11	0.18 (0.01-0.34)	0.97	0.31 (0.17-0.44)	0.94	0.40 (0.29-0.51)	0.90	0.13 (0.05-0.20)	0.36	0.33
Repetitive thinking	11	0.25 (0.09-0.39)	0.88	0.43 (0.30-0.54)	0	0.23 (0.06-0.39)	0.91	0.11 (0.04-0.18)	0.28	0.48
Children/ adolescents	5	0.06 (-0.14-0.26)	0.56	0.38 (0.22-0.53)	0.81	0.04 (-0.18-0.26)	0.88	0.04 (-0.06-0.14)	0	1.00
Adults	6	0.39 (0.18-0.57)	0.77	0.47 (0.29-0.61)	0.51	0.38 (0.22-0.52)	0.72	0.17 (0.07-0.28)	0	0.45
Rumination	2	0.06 (-0.30-0.40)	0.57	0.36 (0.02-0.62)	0.43	-0.01 (-0.39-0.38)	0.02	0.03 (-0.14-0.20)	0	3.00
Children/ adolescents	2	0.06 (-0.25-0.36)	0.57	0.36 (0.02-0.62)	0.43	-0.01 (-0.39-0.38)	0.02	0.03 (-0.14-0.20)	0	3.00
Adults	0	--	--	--	--	--	--	--	--	
Brooding rumination	5	0.33 (0.11-0.53)	0.89	0.42 (0.22-0.59)	0.71	0.27 (0.02-0.49)	0.89	0.16 (0.05-0.27)	0.21	0.59

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Children/ adolescents	1	-0.11 (-0.52-0.34)	--	0.11 (-0.30-0.49)	--	-0.20 (-0.62-0.30)	--	-0.02 (-0.27-0.23)	--	0.10
Adults	4	0.43-0.17-0.63)	0.30	0.48 (0.27-0.66)	0.68	0.38 (0.17-0.55)	0	0.20 (0.07-0.32)		0.53
Reflection rumination	2	0.16 (-0.21-0.49)	0.95	0.38 (0.05-0.64)	0.99	0.19 (-0.21-0.54)	0.98	0.09 (-0.09-0.26)	0.71	0.47
Children/ adolescents	1	-0.12 (-0.53-0.33)	--	0.32 (-0.09-0.64)	--	-0.20 (-0.62-0.30)	--	-0.03 (-0.27-0.22)	--	0.15
Adults	1	0.40 (-0.14-0.76)	--	0.44 (-0.03-0.75)	--	0.52 (0.15-0.76)	--	0.18 (-0.07-0.41)	--	0.35
Self-control	4	0.05 (-0.20--0.30)	0.98	-0.06 (-0.29-0.18)	0	0.05 (-0.23-0.32)	0.98	-0.01 (-0.11-0.10)	0	0.20
Children/ adolescents	3	0.22 (-0.03-0.44)	0	-0.05 (-0.26-0.17)	0	-0.10 (-0.37-0.18)	0.45	-0.01 (-0.12-0.09)	0	0.10
Adults	1	-0.44 (-0.78- -0.09)	--	-0.10 (-0.53-0.38)	--	0.48 (0.10-0.74)	--	0.04 (-0.20-0.27)	--	0.08
COPING: Deactivating strategies	3	0.09 (-0.21-0.38)	0.92	0.04 (-0.24-0.32)	0.71	0.08 (-0.25-0.40)	0.98	0.08 (-0.06-0.22)	0.61	1.00
Children/ adolescents	1	0.14 (-0.29-0.52)	--	-0.01 (-0.38-0.36)	--	-0.30 (-0.67-0.18)	--	0.01 (-0.20-0.20)	--	0.03
Adults	2	0.07 (-0.29-0.41)	0.97	0.07 (-0.29-0.41)	0.98	0.29 (-0.02-0.55)	0	0.14 (-0.06-0.32)	0	0.48
Perceived social support	11	-0.23 (-0.38 - -0.08)	0.93	-0.19 (-0.32--0.04)	0.99	0.22 (0.05-0.38)	0.91	0.06 (-0.01-0.13)	0.75	0.27
Children/ adolescents	3	-0.19 (-0.42-0.07)	0.98	-0.32 (-0.51--0.10)	0.97	0.08 (-0.21-0.35)	0.98	0.10 (-0.02-0.22)	0.94	1.25
Adults	8	-0.25 (-0.43- -0.06)	0.80	-0.13 (-0.30-0.04)	0.85	0.27 (0.12-0.40)	0.47	0.04 (-0.05-0.13)	0	0.15
Relational satisfaction	7	-0.23 (-0.41 - -0.03)	0.92	-0.25 (-0.42--0.07)	0	0.24 (0.02-0.43)	0.89	0.06 (-0.04-0.15)	0	0.25
Children/ adolescents	0	--	--	--	--	--	--	--	--	
Adults	7	-0.23 (-0.41 - -0.03)	0.92	-0.25 (-0.42--0.07)	0	0.24 (0.02-0.43)	0.89	0.06 (-0.04-0.15)	0	0.25
Relational conflict	3	0.22 (-0.08-0.48)	0	0.22 (-0.06-0.47)	0.71	0.30 (-0.03-0.57)	0	0.05 (-0.10-0.19)	0	0.17

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Children/ adolescents	0	--	--	--	--	--	--	--	--	
Adults	3	0.22 (-0.08-0.48)	0	0.22 (-0.06-0.47)	0.71	0.30 (-0.03-0.57)	0	0.05 (-0.10-0.19)	0	0.17
Social comparison	2	-0.11 (-0.45-0.25)	0.49	-0.33 (-0.60-0.01)	0.99	0.10 (-0.30-0.47)	0	0.03 (-0.14-0.21)	0	0.30
Children/ adolescents	2	-0.11 (-0.45-0.25)	0.49	-0.33 (-0.60-0.01)	0.99	0.10 (-0.30-0.47)	0	0.03 (-0.14-0.21)	0	0.30
Adults	0	--	--	--	--	--	--	--	--	
Social self-efficacy	3	-0.22 (-0.48-0.07)	0.74	-0.26 (-0.50-0.01)	0	0.26 (-0.06-0.53)	0	0.07 (-0.06-0.20)	0.33	0.27
Children/ adolescents	0	--	--	--	--	--	--	--	--	
Adults	3	-0.22 (-0.48-0.07)	0.74	-0.26 (-0.50-0.01)	0	0.26 (-0.06-0.53)	0	0.07 (-0.06-0.20)	0.33	0.27
Interpersonal stressors	2	0.21 (-0.15-0.52)	0.02	0.20 (-0.14--0.50)	0	0.24 (-0.16-0.57)	0.43	0.04 (-0.12-0.19)	0	0.17
Children/ adolescents	1	0.24 (-0.19-0.59)	--	0.09 (-0.28-0.44)	--	0.28 (-0.20-0.65)	--	0.02 (-0.16-0.20)	--	0.07
Adults	1	0.17 (-0.38- 0.63)	--	0.31 (-0.18-0.68)	--	0.19 (-0.23-0.55)	--	0.06 (-0.19-0.30)	--	0.32

Note. **Path *a*:** association between independent variable and mediator; **Path *b*:** association between mediator and dependent variable; **Path *c*:** total effect of the independent variable on the dependent variable; ***a*b*:** the indirect effect of the independent variable on the dependent variable controlling the mediator; **I^2**: heterogeneity; **|a*b/c|:** mediation ratio. effect size in mediation analysis.

Publication bias

For the total effect (path *c*), the Egger's test yielded a *p* value of 0.00001. Further, the Trim and Fill analysis using random effects model suggested that 15 studies might be missing. Before the imputation of these potential studies, the pooled *r* was 0.16 (95%CI: 0.01-0.21). After the imputation of the 15 suggested studies, the pooled *r* was 0.11 (95%CI: 0.06-0.16). For the indirect effect (path *a*b*), there was sign of publication bias since the Egger's test yielded a *p* value of .0002. The Trim and Fill procedure suggested that 20 studies were missing. Before the imputation of these studies, the pooled *r* was 0.06 (95%CI: 0.04-0.08). After the imputation of the 20 studies, the pooled *r* was 0.03 (95%CI: 0.01-0.05). Although our analyses suggested that there might be publication bias and the Trim and Fill analysis suggested including a high number of studies, the estimates after imputation are still robust and significant.

To further evaluate the possibility that our results could be due to publication bias, we recalculated our pooled estimates under the following extreme assumptions: (1) published studies are only half of the studies identifying mediating variables between insecure attachment and depression, (2) all unpublished studies found an *r* of 0, (3) the unpublished studies have a sample size that is the same as the sample average of the published studies. Under these extreme assumptions, the pooled *r* for path c was still significant [0.08 (95%CI: 0.05-0.10)]. Similarly, the pooled *r* for path *a*b* showed significance [0.02 (95%CI: 0.01-0.03)]. As such, these analyses indicate that it is unlikely that the observed effects could have been undermined by publication bias.

5.5. STUDY 5. MEDIATING ROLE OF DEPRESSIVE SYMPTOMS LINKING INSECURE ATTACHMENT AND DISORDERED EATING IN ADOLESCENTS: A MULTIWAVE, LONGITUDINAL STUDY

Descriptive Analyses

Estimated means, standard deviations, and correlations between all study variables are presented in Table 15. As can be seen, attachment security was negatively correlated with later depressive symptoms and disordered eating at all-time points, albeit seeming more so for attachment to the mother than to the father.

Table 15. Descriptive statistics and bivariate correlations in the study variables (N = 904)

	Mean/SD																
Variables	Girls (*n* = 447)	Boys (*n* = 457)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. T1 Depressive symptoms	10.14 (6.09)	10.16 (6.32)	1	0.57**	0.39**	0.43**	0.35**	0.34**	0.31**	0.30**	- 0.45**	- 0.41**	- 0.34**	- 0.36**	-0.23*	- 0.18**	- 0.18**	-0.16**
2. T2 Depressive symptoms	11.02 (6.07)	10.58 (6.70)	0.54**	1	0.57**	0.52**	0.25**	0.47**	0.29**	0.35**	- 0.58**	- 0.56**	- 0.46**	- 0.49**	- 0.28**	- 0.28**	- 0.25**	-0.19**
3. T3 Depressive symptoms	12.54 (6.20)	10.17 (5.71)	0.43**	0.50**	1	0.74**	0.26**	0.36**	0.47**	0.48**	- 0.47**	- 0.48**	- 0.52**	- 0.61**	- 0.24**	- 0.18**	- 0.32**	-0.27**
4. T4 Depressive symptoms	13.54 (6.20)	9.84 (5.17)	0.45**	0.47**	0.63**	1	0.25**	0.27**	0.44**	0.46**	- 0.43**	- 0.44**	- 0.50**	- 0.61**	-0.16	- 0.15**	- 0.18**	-0.21**
5. T1 Disordered eating	17.18 (7.45)	17.79 (7.35)	0.35**	0.22**	0.15**	0.12	1	0.53**	0.46**	0.39**	- 0.39**	- 0.35**	- 0.32**	- 0.36**	- 0.04**	0.02**	0.01**	0.02**
6. T2 Disordered eating	12.24 (9.03)	10.65 (8.95)	0.27**	0.38**	0.15**	0.15*	0.51**	1	0.64**	0.56**	- 0.43**	- 0.43**	- 0.38**	- 0.40**	- 0.02**	0.02**	0.01**	0.02**
7. T3 Disordered eating	12.72 (10.17)	7.32 (6.82)	0.22**	0.30**	0.37**	0.34**	0.29**	0.46**	1	0.75**	- 0.41**	- 0.44**	- 0.45**	- 0.53**	- 0.08**	- 0.06**	- 0.12**	-0.02**
8. T4 Disordered eating	13.13 (10.37)	6.19 (6.21)	0.32**	0.36**	0.44**	0.38**	0.38**	0.54**	0.67**	1	- 0.51**	- 0.54**	- 0.53**	- 0.57**	- 0.09**	- 0.10**	- 0.11**	-0.10**
9. T1 Attachment to mother	6.46 (1.85)	6.32 (1.77)	- 0.41**	- 0.51**	- 0.45**	- 0.42**	- 0.17**	- 0.20**	- 0.21**	- 0.26**	1	0.88**	0.71**	0.71**	0.62**	0.54**	0.49**	0.43**
10. T2 Attachment to mother	6.36 (1.87)	6.02 (1.74)	- 0.40**	- 0.50**	- 0.40**	- 0.43**	- 0.17**	- 0.21**	- 0.21**	- 0.19**	0.91**	1	0.76**	0.77**	0.58**	0.53**	0.45**	0.40**
11. T3 Attachment to mother	5.97 (1.95)	5.55 (1.68)	- 0.35**	- 0.45**	- 0.47**	- 0.42**	- 0.14**	-0.12*	- 0.22**	- 0.24**	0.72**	0.73**	1	0.83**	0.54**	0.48**	0.63**	0.46**
12. T4 Attachment to mother	5.91 (2.00)	5.49 (1.51)	- 0.30**	- 0.39**	- 0.44**	- 0.40**	-0.13	- 0.17**	- 0.26**	- 0.22**	0.66**	0.67**	0.63**	1	0.50**	0.49**	0.52**	0.65**
13. T1 Attachment to father	5.77 (1.91)	5.72 (1.84)	- 0.12**	- 0.32**	- 0.15**	-0.09	0.01**	- 0.12**	- 0.01**	- 0.04**	0.55**	0.49**	0.36**	0.30**	1	0.86**	0.68**	0.57**
14. T2 Attachment to father	5.48 (2.03)	5.50 (1.70)	- 0.22**	- 0.39**	- 0.17**	-0.12	0.01**	- 0.12**	- 0.02**	- 0.03**	0.53**	0.51**	0.39**	0.35**	0.82**	1	0.67**	0.64**
15. T3 Attachment to father	5.12 (1.79)	5.02 (1.63)	- 0.24**	- 0.38**	- 0.29**	-0.22*	0.04**	- 0.12**	- 0.10**	- 0.10**	0.47**	0.42**	0.53**	0.45**	0.63**	0.73**	1	0.68**
16. T4 Attachment to father	5.19 (1.97)	4.98 (1.61)	-0.17	-0.31*	- 0.31**	-0.36*	0.05**	- 0.09**	- 0.11**	- 0.15**	0.44**	0.40**	0.49**	0.57**	0.56**	0.60**	0.69**	1

Note. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. Correlations for girls are represented in shadowed area and for boys are represented in white area. *$p < .05$ ** $p < 0.01$

Direct Effects

Even though a random effects DPM did fit the data fairly well, $\chi 2$ = 157.18, df = 38, p < .001, RMSEA = .059, 90%CI: .050-.069, CFI = .977, TLI = .932, a fixed effect model did show a substantially better fit, $\chi 2$ = 20.79, df = 22, p = .53, RMSEA = .000, 90%CI: .000-.026, CFI = 1.000, TLI = 1.001, $\Delta\chi 2$ = 220.62, df = 16, p < .001. However, a hybrid model where non-significant correlations were set to 0, did not produce any worse fit, $\chi 2$ = 30.55, df = 31, p = .49, RMSEA = .000, 90% CI: .000-.024, CFI = 1.000, TLI = 1.000, $\Delta\chi 2$ = 9.82, df = 9, p = .39 (Figure 12). In this model, some effects regarding attachment to the father did emerge at some time points: better attachment at T1 predicted less depression at T2, β = -.08, p = .033, whereas depression at T1 and T2 predicted diminished attachment two years later, β = -.09, p < .001 and β = -.09, p = .031, respectively, and more disturbed eating at T1 did, anomalously, predict better attachment at T2, β = -.06, p = .013. Acknowledging the small effects and most p-values bordering on significance, we tested whether setting paths to and from attachment to the father did alter the fit of the model compared to freeing these parameters. The results revealed that the model with zero-effects for father did not prove to have a better fit $\Delta\chi 2$ = 10.42, df = 6, p = .11, as opposed to setting mother parameters to 0, $\Delta\chi 2$ = 73.00, df = 6, p <.001. Acknowledging the lack of prediction from attachment to father, further analyses were conducted with attachment to the mother only.

A hybrid model of attachment to the mother where the following parameters were fixed to 0: between the time-invariant depression factor and the two other time-invariant factors; disordered eating and attachment; and the correlation between the time-invariant depression factor and eating problems at age 10, did not produce any worse fit than a fixed effects model, $\chi 2$ = 12.29, df = 15, p = .66, RMSEA = .000, 90%CI: .000-.026, CFI = 1.000, TLI = 1.003, $\Delta\chi 2$= 1.33, df = 3, p = .72, and for parsimonious and power reasons this model was retained (Figure 13). All autoregressive paths reached statistical significance. Cross-lagged paths indicated that worse quality of mother-child attachment predicted more depressive symptoms two years later, from T1 to T2 and from T2 to T3. More depressive

symptoms at T1 predicted more disordered eating throughout the whole period (from T1 to T4). Moreover, more disordered eating at T2 and T3 predicted more depressive symptoms at T3 and T4. Finally, depressive symptoms had also a potentially detrimental effect on attachment security: more depressive symptoms at T2 and T3 predicted higher attachment insecurity at T3 and T4 respectively.

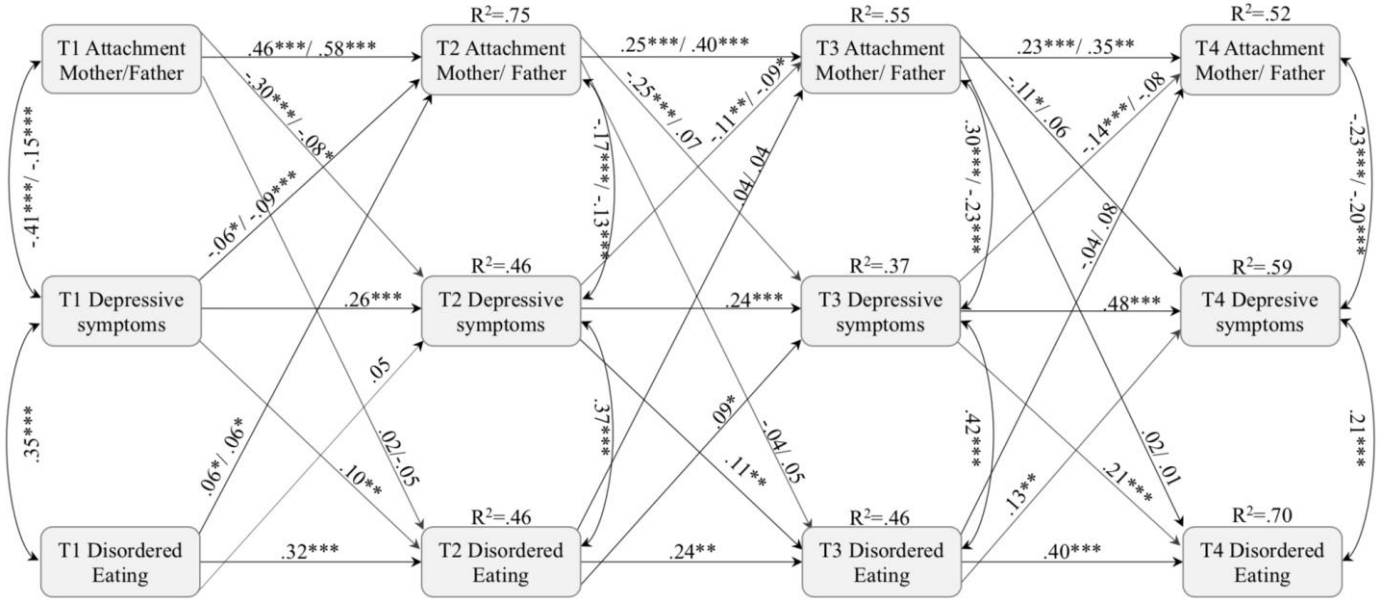

Figure 12. Hybrid model examining the association between depressive symptoms, disordered eating and attachment to the mother and to the father among boys and girls.
Note. Standardized coefficients are depicted. Results for attachment to the mother are named first, results for attachment to the father are named second. $\chi 2$ = 30.55, *df* = 31, *p* = .49; RMSEA = .000, 90%CI:.000-.024, CFI = 1.000, TLI = 1.000. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. *** $p < .001$, ** $p < .01$, * $p < .05$.

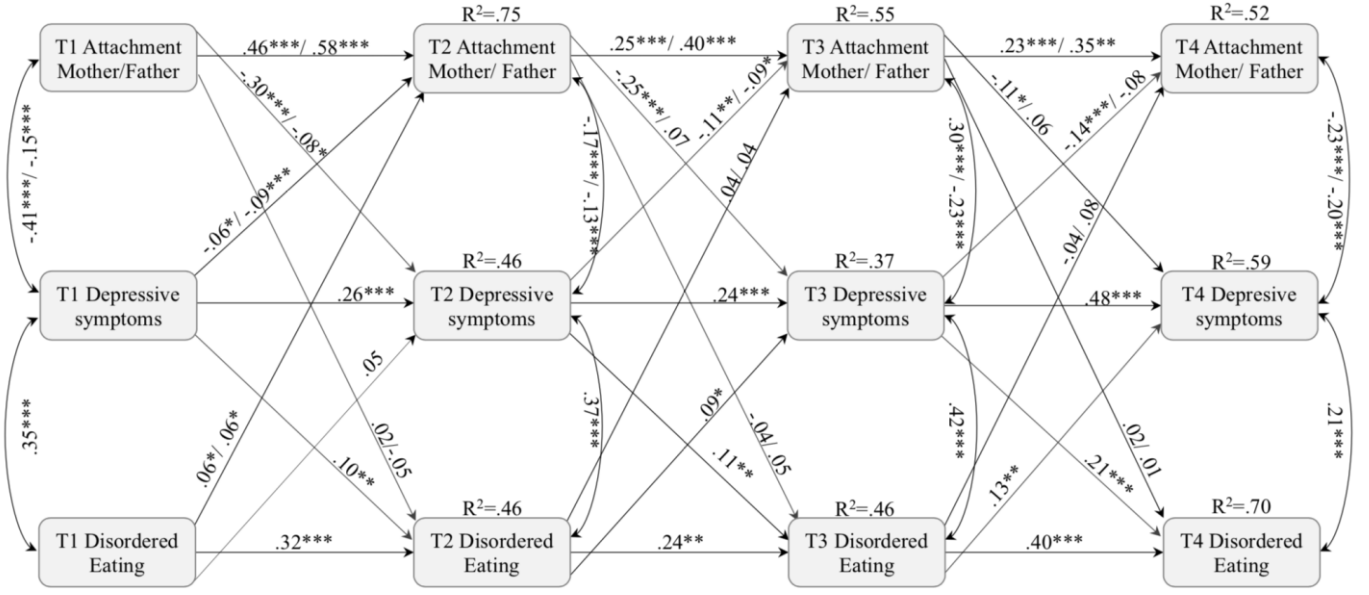

Figure 13. Dual path model hybrid examining the association between depressive symptoms, disordered eating and attachment to mother among boys and girls.

Note. Standardized coefficients are depicted. Thick arrows = Significant cross-lag paths. FULL SAMPLE. $\chi 2$=12.29, df=15, p=.66, RMSEA = .000, 90%CI:.000-.026, CFI = 1.000, TLI = 1.003, $\Delta\chi 2$ = 1.33, *df* = 3, *p* =.72. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. *** $p < .001$, ** $p < .01$, * $p < .05$.

Indirect Effects

To investigate mediation, we adjusted for all relevant direct effects, e.g. when examining the potential effect of insecure attachment at age 10 on eating problems at age 16 via depression at age 12 and/or 14, we adjusted for the direct effects of depressive symptoms and attachment at age 12 as well as the direct effect of age-10 attachment. Bootstrapped asymmetric confidence intervals with 1000 draws were applied. The fit for the model adjusting for direct effects provided a good fit, $\chi 2$ = 8.12, *df* =11, *p* =.70, RMSE = .000, 90%CI: .000-.027, CFI = 1.000, TLI = 1.003. The results are depicted in Figure 14; with each mediational path having its own illustrative pattern. Higher insecure attachment to the mother at age 10 predicted more disordered eating at age 16, via increased depressive symptoms at age 12, which in turn predicted continued increased depressive symptoms at age 14, predicting more symptoms of disordered eating at age 16, *B* = -.10, 95%CI: .01-.21 (Figure 14, path 1). This amounted to 8.2% of the effect of age-10 attachment on age-16 disordered eating. Moreover, insecure attachment at age 10 predicted disordered eating at age 16 via continued insecure attachment at age 12, and then more depressive symptoms at age 14, and in turn increased disordered eating at age 16, *B* = -.13, 95%CI: .03-.23 (Figure 14, path 2), adding 5% to the share of the explained association.

Furthermore, there was an effect of insecure attachment at age 10 via increased depressive symptoms at age 12, thereafter disordered eating at age 14, and then on continued disordered eating at age 16, *B* = 15, 95%CI: 02-.31 (Figure 14, path 3); a 6.8% share of the association between attachment at age 10 and disordered eating at age 16. Insecure attachment at age 12 predicted more disordered eating at age 16 via increased depressive symptoms at age 14, *B* = -.26, 95%CI: .06-.41 (Figure 14, path 4); amounting to 30.0% of the total effect. The same effect was also seen two years earlier, from age 10 insecure attachment to age 14 disordered eating via depressive symptoms at age 12, *B* = .34, 95%CI: 02-.60 (Figure 14, path 5); 21.9% of the total effect.

To be noted, sum of all the indirect effects fully mediated effects of insecure attachment on later eating psycopathology, as there were no direct effects of insecure attachment at T1 on eating problems at T3, β =.11, p = .21 or insecure attachment on eating problems at T4, β = .04, p = .83. As regards the reverse mediational effects (Figure 14, path 6), disordered eating at age 12 predicted reduced attachment to mother at age 16 via depression at age 14, B = -.02, 95%CI: -.05-.00; 25% of the total effect. No other reverse mediational effects– including from attachment or disordered eating to depression– were significant.

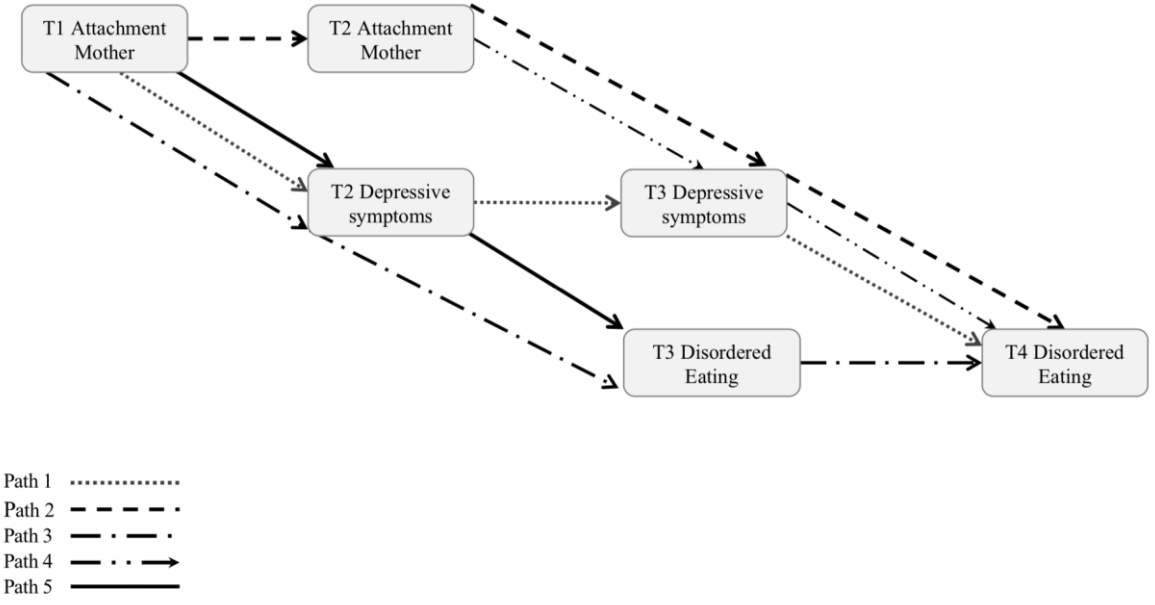

Figure 14. Mediation model adjusted for direct effects examining the association between depressive symptoms, disordered eating and attachment to mother among the whole sample.
Note. Standardized coefficients are depicted. $\chi 2$ =8.12, *df*=11, *p*=.70, RMSEA=.000, 90%CI:.000-.027, CFI=1.000, TLI=1.003. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4.

Child's Gender-specific Effects

To investigate whether the above indirect effects differed by gender, separate models for girls and boys were computed. Importantly, the difference in magnitude of the mediational effect was not different for both genders (Table 16).

Table 16. Gender specific-effects

	Girls		Boys		Gender difference in mediation	
	β	95% CI	*β*	95% CI	*β*	95% CI
Path 1: Att1→Dep2→Dep3→Eat4	-.01	-.03, .004	-.01	-.03, .01	.01	-.56, .33
Path 2: Att1→Att2→Dep3→Eat4	-.02	-.004, .003	-.01	-.03, .02	.07	-.78, .42
Path 3: Att1→Dep2→Eat3→Eat4	.01	-.02, .03	-.01	-.03, .01	-.01	-1.66, .49
Path 4: Att2→Dep3→Eat4	-.04	-.07, .01	-.02	-.07, .04	.10	-1.42, .70
Path 5: Att1→Dep2→Eat3	-.03	-.28, .16	-.07	-.47,.02	.10	-1.33, .34

Note. *β* = standardized regression coefficient

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VI. GENERAL DISCUSSION

6. GENERAL DISCUSSION

As mentioned in the Introduction section, many adolescents experience subclinical forms of EDs and depression with resulting impairment resembling that stemming from full clinical forms (Ayuso-Mateos et al., 2010; Stice et al., 2009). Insecure attachment relationships have been consistently associated with the development of disordered eating and depressive symptoms (Faber et al., 2018; Morley & Moran, 2011; Tasca, 2018). However, prospective research among adolescents has yielded inconclusive and methodological limited results; therefore, there are still a number of important questions to address. A continuing limitation is that the literature often seems to be driven mainly by a desire to retest old findings such as the direct/unidirectional impact of insecure attachment, particularly to the mother, on the development of psychopathology without considering the dynamic nature of *IWMs*, especially in the developmental context of middle childhood to adolescence, and, therefore, the potential reverse association between the variables. Recently, research has risen questions about how such documented associations could be explained, but it is still unknown which processes function as a link between insecure attachment and eating and depressive symptoms. It is also not clear the role that other attachment figures, such as fathers and peers, play in this regard, despite the potential importance they may have in the transition to adolescence. Disentangling the interrelationships between the target variables using reciprocal and dynamic models will provide valuable information at both theoretical and practical levels. In light of the current gaps in the literature, the **main objective** of the present Doctoral Thesis was to examine the prospective reciprocal associations between the quality of attachment relationships (to the mother, father and peers, separatedly) and disordered eating and depressive symptoms from middle childhood to adolescence. In addition, it was sought to identify which variables are contributing to such associations and to test a mediational model in which insecure attachment may predict disordered eating in adolescents via depressive symptomatology.

6.1. RECAPITULATION OF MAIN FINDINGS AND INTERPRETATION

The results obtained in this work are further discussed below according to the specific objectives of the present Doctoral Thesis.

Objectives 1 & 2. ***To explore the reciprocal associations between the quality of attachment relationships and disordered eating beyond the impact of preexisting symptomatology from middle childhood to adolescence, and to examine whether the bidirectional associations between attachment relationships quality and disordered eating differ depending on the attachment figure (i.e. mother, father, peers) or between boys and girls (Study 1).***

In general, and as expected, better attachment to the mother was a protective factor against the development of disordered eating, in both boys and girls, although in girls such effects were stronger. Of note, this influence was exerted at different time points over six years, differing by gender. Moreover, there was a reciprocal effect of disordered eating on the quality of attachment relationships with the mother, only among girls. Our results underlined the differential role that fathers and peers play in the development of disordered eating among adolescents, especially among boys. The following is a more detailed explanation of these novel findings.

First, our findings converge with prior longitudinal studies reporting that less secure attachment to mother predicted increases in ED symptoms (Burge et al., 1997; Goossens et al., 2012). Moreover, gender comparisons showed that only in girls, confidence and communication with the mother were prominent and lasting protectors, from 10 to 16 years old, against disordered eating. On the other hand, better mother-son attachment relationship had also a protective influence against disordered eating, but this effect was smaller and remained significant only at the ages of 10–12 years. These differences may respond to the gender-specific relationships that girls and boys are expected to have with their mothers (Margolese et al., 2005). While girls maintain a close relationship with their mothers, boys become more autonomous and reduce the amount of

support they seek from their mothers with age (Delgado-Gallego et al., 2011). In responding to the possibility of a reverse negative influence of disordered eating on the quality of attachment relationships with the mother, our results supported this statement but only in girls, disordered eating at the ages of 14–15 years influenced the quality of attachment to mother two years later, which is in line with recent bidirectional findings (Crespo et al., 2010; Korotana et al., 2018). So far, our results suggest that insecure attachment is rather a risk factor and not a sequela as this reverse effect was smaller.

Second, concerning the role of the father, we found that the quality of parental attachment relationships did not differ significantly between boys and girls. However, the direction of the effects was different. Concretely, girls that reported better attachment to the father at the ages of 10–11 years also informed less disordered eating two years later, supporting the role of fathers promoting healthy eating attitudes and behaviors in their daughters during early adolescence (Korotana et al., 2018; Pace et al., 2012). Conversely, boys who reported more disordered eating at the ages of 10–11 years also reported better attachment to the father two years later. An explanation for the direction of this effect could be that fathers may serve as a buffer in the common discrepancy between the ideal and perceived body sizes that boys experience at this developmental stage (Michael et al., 2014). Plausibly, boys who deal with disordered eating tend to rely on their fathers in order to cope with their difficulties. In fact, during the first half of adolescence, boys tend to place fathers higher in their attachment hierarchies than girls (Viejo et al., 2018). In this regard, fathers would meet one of the primary functions of significant attachment bonds which are the *secure base* (Kerns et al., 2015). After all, for 10 years-old-boys, fathers might become a point of reference to their sons as a gender-specific role model (Buist et al., 2002). Nevertheless, this effect was counterintuitive and small, so it should be interpreted with caution and needs further replication.

Regarding the quality of peer attachment, girls reported higher attachment to peers than boys throughout the period explored. This confirms the tendency in girls of reaching more often social support,

showing more intimacy and self-disclosure in their friendships and greater emotional needs than boys (Nickerson & Nagle, 2005; Viejo et al., 2018). Notwithstanding, no significant associations between attachment to peers and disordered eating among girls were observed. In this regard, peer relationships are more likely to serve the daily needs for support and enjoyment rather than the emergency situations that imply danger to the self or the threats to an attachment figure's availability (Kerns & Brumariu, 2016; Rosenthal & Kobak, 2010). Our results align with prior evidence (Field et al., 2001), but contradicts literature that endorses peer influence through appearance-based conversation or "fat talk" on unhealthy eating behaviors in girls (Field et al., 2008; Wertheim & Paxton, 2011). Nevertheless, as aforementioned, it seems unclear whether or not friends provide a protective environment against disordered eating and further research including peers is needed.

On the contrary, among boys aged 10–12 years old, a positive and significant effect, although small, of attachment to peers on disordered eating emerged. That is, boys that reported better attachment relationships with their peers at 10 years old (more proximity and communication) also reported more disordered eating at 12 years old. It should be noted that during the transition to adolescence, not only boys care more about their own bodies in terms of body performance and muscularity, but also, they are more vulnerable to peer pressure or influence (Steinberg & Monahan, 2007). A number of studies obtained evidence that comments made by peers such as encouragements to become more muscular (McCabe & Ricciardelli, 2003; Ricciardelli, 2012) or to lose weight were predictive of bulimic symptomatology and binge eating in adolescent boys (Le Grange et al., 2014; Vincent & McCabe, 2000). Another explanation of our results could be that a premature "*attachment"* to peers might not be functional as it has been associated with high susceptibility to negative peer influence and increased internalizing and externalizing problems (Rosenthal & Kobak, 2010). Nevertheless, these findings should be taken with caution, as we could not ascertain whether their chosen friends experienced or expressed eating pathology representing, therefore, a negative influence for the development of

disordered eating (Le Grange et al., 2014). In consequence, further studies are needed to disentangle this discordance.

Objectives 3 & 4. ***To explore the reciprocal associations between insecure attachment to parents and depressive symptoms beyond the impact of preexisting symptomatology and potential time-invariant factors from middle childhood to adolescence, and to examine whether the bidirectional relationships between depressive symptoms and disordered eating vary as a function of the parental and child's gender and developmental period (Study 2).***

We found that better quality of attachment to the parents predicted fewer depressive symptoms, which parallels previous longitudinal evidence (Agerup et al., 2015; Duchesne & Ratelle, 2014; Sund & Wichstrøm, 2002). For the first time, we showed that poor attachment relationships predicted later depressive symptoms, even when all the time-invariant factors were accounted for, thus ruling out one important group of obstacles – but certainly not all – to inferring the influence of attachment insecurity on depressive symptoms. In consonance with Bowlby´s Theory (1969/1982), adolescents – holding positive and functional *IWMs* – are more likely to use more adaptive coping strategies facing distress (Mikulincer & Shaver, 2012; Morley & Moran, 2011), as they have internalized a representation of their parents as available and reassuring as well as open to communication (Kerns et al., 2015).

Moreover, our results informed that depressive symptoms predicted deterioration of attachment to parents, albeit from age 12 to 16. Previous research has documented substantial change in attachment patterns during childhood and adolescence (Buist et al., 2002). In trying to explain these findings, one line of research has drawn attention to changes in parent-child interactions when entering adolescence. Parents do indeed change in their sensitivity and emotional availability over the years as they must balance the respect for the adolescent's autonomy with the continuing need to protect their child from danger and risky behaviors (Kobak et al., 2017; Lamb & Lewis, 2011). At the same time, adolescents decrease gradually

their dependence on parents (Allen & Tan, 2016). Conversely, depression may impede parent-child communication and closeness, and increase conflicts, which in turn may manifest in the child not any longer believing in her/his parents as a source of comfort or help (Boutelle et al., 2009; Branje et al., 2010; Brière et al., 2013). Taken together, the present research supports the view of the attachment-depression relation in middle childhood and adolescence as a dynamic and reciprocal one (Boutelle et al., 2009; Brumariu & Kerns, 2010).

Another inquiry addressed was to disentangle whether attachment to the mother or to the father had a differential impact on the development of depressive symptoms. In this regard, it was found that poor attachment quality to the mother had a stronger impact on depressive symptoms than poor attachment to the father, especially from 12 to 14 years of age. These findings converge with studies finding adolescents to rely more on their mothers as their *safe haven* in times of distress than on their fathers (Kerns et al., 2015; Markiewicz et al., 2006). The mother's more active role in daily childcare fosters greater emotional closeness, which provides her with greater knowledge to quickly respond to the child's demands and needs to regulate his/her negative emotions. It is plausible that adolescents who perceive that they cannot freely communicate their negative emotions and need for security to their mothers manifest more emotional problems and, therefore, are at greater risk for depressive symptoms (Duchesne & Ratelle, 2014). Furthermore, depressive symptoms had a stronger detrimental effect on attachment to the mother during the transition to middle adolescence (from 14 to 16 years old). If one assumes that mothers are emotional closer than fathers, depressed adolescents' search for support and comfort could have a harmful effect mainly on relationships with their mothers (Joiner & Metalsky, 2001). In fact, at later developmental periods, fathers are often perceived as less affectively salient and available during this period (Viejo et al., 2018) and they could be relegated as main attachment figures, which may explain the lack of effect (Rosenthal & Kobak, 2010). Despite the fact that our results highlight mothers as the primary attachment figures vis à vis depressive symptoms during adolescence, the father´s lack of contribution should

be interpreted with caution. Actually, we obtained high correlation between maternal and paternal attachment, and small-to-moderate correlations between better attachment with the father and depressive symptoms. Further studies are needed to replicate these findings considering the complexities and developmental differences in adolescents' attachment hierarchies.

Regarding child's gender-specific effects, girls' depressive symptoms seem to be more affected by the quality of attachment relationships with their parents than boys, particularly from 12 to 14 years old, even when adjusting for all time-invariant confounding, which supports prior research (Lewis et al., 2015; Margolese et al., 2005; Windle, 1992). The greater sensitivity of early adolescent girls can respond to the possibility that, besides facing pubertal changes – which is also a risk factor for depressive symptoms (Patton et al., 2008; Skoog et al., 2016) –, girls tend to emphasize the importance of maintaining relationships and when they fail to do so they may become more vulnerable to depression (Nolen-Hoeksema & Hilt, 2009). Thus, when parents do not provide the necessary support and comfort in times of emotional distress, early adolescent girls may be more vulnerable to develop depressive symptoms, possibly influenced by *IWMs* of themselves as unlovable and of others as unloving and by a sense of uncontrollability and helplessness (Stovall-McClough & Dozier, 2016).

Conversely, depressive symptoms among boys were less influenced by the quality of attachment, given that, as mentioned, boys tend to develop more autonomy and to separate from their parents as they grow (Galambos, 2004). Also, adolescent boys' emotional coping styles include more evasive tendencies in line with gender roles expectations (Giudice & Belsky, 2010; Polce-Lynch et al., 2001). However, a different picture notwithstanding was reported in early childhood, when insecure attached boys are at similar or even higher risk for developing internalizing symptoms (Madigan et al., 2013). In light of this evidence, it is possible that insecure attachment may also have an impact on the development of depressive symptoms in boys, but in a different developmental period.

Objectives 5 & 6. ***To identify the main mediators through which insecure attachment confers vulnerability to the development of ED symptoms through a systematic review of the literature and to quantify the size effect of each of the mediators through a meta-analysis (Study 3)***

Consistent with previous reviews (Jewell et al., 2016; Tasca & Balfour, 2014), emotional dysregulation strategies at both clinical and sub-clinical level, and depressive symptoms at sub-clinical level were the mediators with the largest effect size involved in the relationship between insecure attachment style and eating disorder symptoms. Moreover, body dissatisfaction, neuroticism, perfectionism, mindfulness and social comparison yielded significant impact, but their effect size ranged from moderate to low.

Overall, our findings support the high prevalence of insecure attachment in the clinical population and its role as risk factor for the development of eating psychopathology in conjunction with mediating mechanisms (Kuipers & Bekker, 2012; Ward et al., 2000). Moreover, we did not find any significant difference on the impact of these variables among female samples and mixed samples. It was observed that recent studies showed the tendency to include more male participants, as they are also at risk of presenting disordered eating, mainly in terms of muscularity concerns and abnormal energy intake (Murray et al., 2017; Ricciardelli, 2012). In addition, there was no association between specific insecure attachment styles and EDs subtypes, which aligns with previous reviews (Faber et al., 2018; Tasca, 2018). Unexpectedly, and contrary to broad literature (Tasca, 2018; Zachrisson & Skårderud, 2010), when comparing the effect sizes of the mediators in clinical versus non-clinical samples, we found that effect sizes were larger in general population than in ED patients. One interpretation for these results could be that the direct effect of insecure attachment on ED symptoms is stronger than the indirect effect through mediators in the clinical samples included in this meta-analysis. Likewise, it is important to consider that most of the studies included in this meta-analysis were conducted with non-clinical populations.

Following is a summary and discussion of each of the main mediators found in this study.

Dysfunctional emotion regulation was a robust mechanism involved in the relationship between insecure attachment and ED symptoms at both clinical and sub-clinical level. These findings have been also sustained by previous meta-analyses (Aldao et al., 2010; Faber et al., 2018). It is known that insecurely attached people report inability to regulate their emotions (Brumariu, 2015; Mikulincer et al., 2003). In this regard, even unhealthy eating behaviors could emerge as a way to get relief or to escape from negative emotions (Taube-Schiff et al., 2015; Wilkinson, 2010), either in the form of binge eating to reduce emotional distress (Brumariu, 2015; Stice, 2002), or in the form of excessive exercise or dieting to reaffirm control and self-confidence (Bradford & Petrie, 2008; Han & Pistole, 2014).

Depressive symptoms yielded one of the highest effect sizes, importantly only at sub-clinical level, as there were no studies using clinical samples (Schembri & Evans, 2008; Shanmugam et al., 2012). Depressive symptomatology has been identified as one of the strongest predictors of eating problems (Abbate-Daga et al., 2010; Mayer et al., 2009). According to Stice (2002), negative affect along with dieting predicts the subsequent development of bulimic pathology. Moreover, Morley and Moran (2011) argued that individuals with insecure attachment hold maladaptive cognitive patterns and self-representations that increase their vulnerability to develop depressive symptomatology following adverse life events. Taking into account this robust evidence, individuals with insecure attachment may think and behave in a manner that favors the development of eating psychopathology through depressive symptoms.

Body dissatisfaction was also identified as a mediating variable (Bäck, 2011; Koskina & Giovazolias, 2010); however, it did not yield a significant effect size among ED samples. It is possible that this result can be due, at least partially, to the characteristics and design of two out of four included studies. For instance, Tasca et al. (2006), tested a model specifically designed for patients with BN, using a sample of women mostly with AN and simultaneously analyzed the

negative affect in the mediational model which could have reduced the effect of body dissatisfaction. Also, Monteleone et al. (2017), assessed body dissatisfaction in terms of lived corporeality which is the difficulty experiencing the body from an inner perspective. Further research therefore should examine its mediational impact in clinical samples.

Neuroticism had a significant impact on the development of ED symptoms – as previously found (Ormel et al., 2013; Watson, 2001) – meaning that insecurely attached individuals with more neurotic personality characteristics were more likely to display disordered eating symptoms (Eggert et al., 2007; Münch et al., 2016). Based on this, it can be suggested that insecure attachment influences disordered eating indirectly through personality characteristics.

Based on empirical evidence among clinical and non-clinical populations, *maladaptive perfectionism* was also found to be a significant mechanism linking insecure attachment to ED symptoms (Boone, 2013; Dakanalis et al., 2014; Shanmugam et al., 2012). That is, insecurely attached individuals are likely to be overly self-critical comparing themselves with others that they consider to be potentially better and therefore, they set for themselves extraordinary goals in order to overcome this obstacle, but when they fail in achieving the proposed goals their feelings of worthlessness and hopelessness increase (Bardone et al., 2000; Bartholomew & Horowitz, 1991; Wei et al., 2006). Furthermore, research has pinpointed to maladaptive perfectionism as a risk factor to develop ED symptoms in both clinical and non-clinical samples (Dakanalis et al., 2014).

Reduced mindfulness capacity was identified as another mediating mechanism (Pepping et al., 2015; Redondo & Luyten, 2018). Patients with bulimia and binge eating, often struggle detecting and discriminating interoceptive cues (Monteleone et al., 2017). On the other hand, insecurely attached individuals may ignore or minimize their emotions (avoidant style) or constantly worry about a future abandonment (anxious attachment), this unawareness could lead them to disordered eating (Brown & Ryan, 2003).

Finally, *social comparison* was identified as a significant mediating variable among non-clinical sample and clinical sample,

but had the lowest effect size. According with the Festinger's Theory of Social Comparison (1954), human beings seek objective social standards in order to evaluate their self-worth and status. In this sense, women with insecure attachment tend to compare themselves socially and idealize others more frequently (Bamford & Halliwell, 2009), which poses a risk for developing abnormal eating attitudes in the attempt to achieve an aesthetic ideal and reduce negative feelings about themselves (Stice & Whitenton, 2002).

Objectives 7 & 8. ***To identify the main mediators through which insecure attachment confers vulnerability to the development of depressive symptoms through a systematic review of the literature, and to quantify the size effect of each of the mediators through a meta-analysis (Study 4).***

Our results support an *enduring* effects model of attachment that involves different cognitive-emotional mechanisms as pathways that contribute in the association between insecure attachment and the development of depressive symptoms, which is in agreement with previous reviews (Malik et al., 2015; Morley & Moran, 2011). Contrary to our expectation, the meta-analytic evidence of indirect effects of certain variables pertaining to the interpersonal domain was not significant.

According to primary analyses, the influence of the different cognitive-emotional-interpersonal mediators prevails regardless of type of sample (clinical or non-clinical), gender (male or female) or insecure attachment style (anxious or avoidant). Differences were only found between studies with adults and with children/adolescents; concretely, the indirect effects of insecure attachment through these mediators were not significant in the latter group. Such findings might be explained, at least in part, by the following reasons. First, the majority of studies used non-clinical adult samples and it might be possible that the underlying mechanisms through which insecure attachment exerts its influence on childhood and adult depression might differ (Harrington et al., 1996). Nevertheless, this hypothesis needs to be confirmed by further longitudinal research. Second, as the caregiving environment is relatively stable in childhood and

adolescence, the direct impact of early attachment experiences in predicting the development of depressive symptoms is more evident than at a later developmental stage (Groh et al., 2014; Groh et al., 2012). During adulthood, however, as individuals develop and new attachment relationships are established, it would appear that such direct path diminishes over time (Lamb et al., 1984; Lewis, 1998). In this vein, and according with prior research (Fraley et al., 2013), our findings support that the effects of early attachment experiences on depressive symptoms might be sustained over time through relative consolidated mediators.

As regards the main mediators of the cognitive domain, as expected, our results showed that insecure attachment increases the risk for depression by cognitive processes, particularly, via dysfunctional attitudes, self-criticism and low self-compassion.

In line with Attachment Theory, *dysfunctional attitudes* can be considered as cognitive products that result from negative mental representations or working models (Hazan & Shaver, 1994; Morley & Moran, 2011) and as predictors of depression in adults (Abramson et al., 2002; Scher et al., 2005). Adults who experienced early insecure parent-child attachment relationships hold these relatively enduring, underlying attitudes and assumptions of themselves and the world (i.e., dysfunctional attitudes) which, in turn, predispose them to increases in depression (Cummings & Cicchetti, 1990; Gotlib & Hammen, 1992). In addition, *self-criticism* understood as a harsh self-evaluation accompanied by an intense fear of being disapproved or criticized by significant others (Blatt & Homann, 1992), proved to be a significant mediator. From an attachment perspective, when individuals experience inconsistent early caregiving, they are more likely to fear rejection by others and hold a negative view of themselves (Lyons-Ruth & Jacobvitz, 2016). Such negative feelings elicit self-criticism which initially may serve to help correct their misbehaviour and keep a good standing with others (Blatt & Homann, 1992; Zuroff & Fitzpatrick, 1995). Yet, self-critical individuals holding negative working models may systematically interprete failures as evidence of their unworthiness which will increase the appearance of depressive symptoms (Blatt, 2004). Lastly, our results

indicated that low levels of *self-compassion* had one of the highest indirect effect sizes linking insecure attachment to depression. Self-compassion appears to operate as an effective self-regulatory strategy for dealing with negative emotions (Vettese et al., 2011). In fact, self-compassion, which can be understood as the inverse of self-criticism (Neff, 2003), may help insecurely attached individuals to experience less emotional distress (Mackintosh et al., 2018). Notably, the ability to self-soothe after stressful or threatening events, which is closely related to self-compassion, develops when the child is comforted by his caregivers in early relationships (Mikulincer & Shaver, 2016). Self-compassion helps to buffer people against the negative cognitive implications of their mistakes (Körner et al., 2015; Terry & Leary, 2011). Consequently, lacking self-compassion would contribute to increased self-criticism and negative self-feelings among insecurely attached people after personal failures or inadequacies, and eventually, result in more depression.

As regards the emotional domain, insecurely attached people struggle facing negative emotions as result of real or perceived lack of effective coping strategies (which can be very much entwined with maladaptive cognitive factors) and, in turn, are more likely to become depressed. In this regard, our results support hyperactivating emotion regulation strategies as significant mediators in the link insecure attachment-depression. Particularly, individuals with anxious attachment are hypothesized to use *hyperactivating strategies* which include the use of worry and rumination and a tendency to overreact to their negative feelings, thus gaining support and attention from others (Cassidy, 2016; Mikulincer & Shaver, 2016). Although perhaps these strategies may be initially seen as adaptive for these individuals—particularly, within parent-child relationships in which they were shaped—, they often fail to regulate emotions and can amplify distress (Aldao et al., 2010; Malik et al., 2015). As such, individuals with an ineffective coping system as a consequence of having insecure attachment are more vulnerable to developing depression.

The present meta-analysis evidenced that *repetitive thinking* and, more precisely, *brooding rumination* as specific mechanisms. These

results are in line with the research of Malik et al. (2015) who asserts that emotion dysregulation broadly explains the attachment-depression link. *Repetitive thinking,* which consists of a perseverative, constant, and relatively uncontrolled cognitive activity centered on negative features of the self and relationships (Watkins, 2008), and more specifically, *brooding rumination*, have been identified as mediators explaining the link attachment-depression in both clinical (Beyderman & Young, 2016) and subclinical samples (Margolese et al., 2005; Ruijten et al., 2011). By contrast, the reflection component of rumination was not identified as a significant mediator. This is not surprising, as prior findings have shown that *brooding* clearly represents the most maladaptive component of rumination and predicts the development of depressive symptoms (Burwell & Shirk, 2007; Olson & Kwon, 2008; Senra et al., 2018); however, the role of the *reflection* in depressive symptoms has not been clarified yet (Burwell & Shirk, 2007). The present study supports the idea that insecurely attached people are likely to get trapped in a spiral of repetitive and negative thoughts (i.e., brooding), focusing their attention on fear of abandonment or failure which in turn fosters the development and maintenance of depressive symptoms.

Concerning the interpersonal domain, and despite the hypothetical mediating role that *interpersonal processes* could have (Hankin et al., 2005; Williams & Risking, 2004), the present study did not find significant estimates of their indirect effects. The lack of significance of factors pertaining to this domain might be partly explained by the reduced number of studies exploring such variables compared with the broad research testing cognitive-emotional mediators. Also, it is plausible that these variables may function as *moderators*, that is, they could indeed contribute to the development of depressive symptoms but interacting with negative attachment cognitions and emotional dysregulation that arise from insecure attachment relationships (Hammen et al., 1995; Hankin et al., 2005). For instance, negative cognitions and dysfunctional attitudes have been broadly associated with interpersonal problems such as perceptions of poorer social skills and less satisfaction in social relationships (Compas et al., 2009; Rudolph, 2009), and self-reports

of negative social interactions (Hammen, 2009; Lakey et al., 1994). Also, self-critical individuals emphasize achievement at the expense of interpersonal relationships, which may lead to interpersonal stress and lack of social support (Priel & Shahar, 2000). Similarly, brooding rumination has been associated with deficits in interpersonal functioning, such as excessive dependency on others (Gorski & Young, 2002) and impaired social problem-solving (Watkins & Moulds, 2005).

Longitudinal research is, however, needed to further elucidate these developmental pathways to depression as sequential mediation or moderational in nature.

Objectives 9 & 10. ***To explore whether depressive symptoms constitute a pathway through which insecure attachment to the mother predicts subsequent development of disordered eating in the transition from middle childhood to adolescence —even when adjusting for initial levels of depression, disordered eating, attachment and all unmeasured time-invariant potential confounders, and to examine whether the effects will differ by child's gender (Study 5).***

Our results confirmed that insecure attachment contributes to the development of eating problems via increased depressive symptoms, even taking into account all time-invariant potential confounders. No significant effects involving attachment to the father were found. Moreover, our findings did not show any, gender-specific or reciprocal effects.

First, as regards the attachment-depression link, insecurely attached children at age 10 might be more prone to develop depressive symptoms at ages 12 and 14, mainly due to the cognitive-affective representations rooted in early negative experiences with care providers (Brumariu & Kerns, 2010; DeKlyen & Greenberg, 2016). Indeed, adolescents with early negative attachment experiences tend to focus selectively on disappointing aspects of a situation, which may further consolidate their negative self-concept over time (Morley & Moran, 2011). Holding a negative self-concept —during this

developmental period— may thus negatively bias the perception of feedback from others more strongly than during earlier or later periods (Hankin et al., 2005; Harter, 2006; Rudolph, 2009). Second, with respect to the depressive symptoms-disordered eating link, our results demonstrated that more depressive symptoms at ages 12 and 14, predicted more disordered eating at ages 14 and 16, respectively. These findings support the view that disordered eating may arise as a way to self-regulate or escape from negative emotions (Ferreiro et al., 2014; Goossens et al., 2011; Haedt-Matt & Keel, 2011; Stice et al., 2017).

Taken together, the aforementioned results suggest that children insecurely attached to the mother —who presumably perceive themselves negatively and without emotional support of their main attachment figure— may show compromised ability to face the challenging transition from middle childhood to adolescence (e.g., body changes related to puberty finding themselves moving farther from the Western ideal beauty [Ricciardelli, 2012; Wertheim & Paxton, 2011], school transition; [Evans et al., 2018], negative interpersonal interactions [Rudolph, 2009]), resulting in increased depressive symptoms and may find refuge in abnormal eating practices (Tasca, 2018). For instance, binge eating might reduce negative affect and allow for momentary relief from reality, yet, at the same time, perpetuating this maladaptive cycle through negative reinforcement (Faber et al., 2018). Similarly, as body image becomes crucial for adolescents' self-esteem (Ricciardelli, 2012; Wertheim & Paxton, 2011), boys and girls may engage in extreme dieting or in other harmful weight-control strategies (e.g., laxative use, excessive exercise) in an effort to achieve an ideal body shape and reduced unpleasant affect related to a negative image of themselves (e.g., (Calzo et al., 2015; Johnson & Wardle, 2005). The present findings substantiate existing literature supporting the role of insecure attachment to the mother as a risk factor in the development of disordered eating (e.g., Cortés-García et al., 2019; Goossens et al., 2012), yet expands it by indicating that depressive symptoms serve as one intermediate mechanism driving this relation.

The present investigation demonstrates that depressive symptoms play a central role in transferring the effect of attachment insecurity to the mother on the development of disordered eating and *vice versa*, regardless of gender. However, our results run counter to studies showing that these effects are stronger in adolescent girls than in boys (Allen et al., 2007; Crespo et al., 2010; Lewis et al., 2015). Conceivably, this discrepancy may partly be due to the fact that previous studies measured parent-child relationships (e.g., family connectedness, family conflict, lack of emotional closeness to parents) and not attachment quality *per se*. Moreover, these studies did not explicitly test a mediational model and did not adjust for time-invariant factors.

The lack of gender specific-effects in our model seems to point to the importance of attachment to the mother as *safe haven* in reducing the likelihood of depressive symptoms and disordered eating in girls and boys alike (e.g., Agerup et al., 2015; Goossens et al., 2012). Importantly, this result underlines that higher risk to develop disordered eating also pertains to boys (Sweeting et al., 2015), although their body image concerns and the magnitude of ED symptoms are lower (as echoed in our results).

In sum, based on the current findings, insecurely attached boys and girls who hold negative cognitive-affective representations, may think and behave in a manner that fosters disordered eating via an increase in depressive symptoms; although, the effect sizes reported were small to moderate.

6.2. STRENGTHS AND LIMITATIONS

The current investigation gathered evidence from pioneering studies considering the reciprocal associations between the quality of attachment to different attachment figures and disordered eating and depressive symptoms from middle childhood to adolescence (studies 1 and 2). Also, it included the first investigation on the mediational role of depressive symptoms in the association between attachment and disordered eating, prospectively with adolescents (study 5).

A further common strength of studies 1, 2 and 5 was the recruitment of a large community sample of boys and girls, which increased the generalizability of the results. The inclusion of boys and girls allowed the examination of gender differences which may contribute to design better tailored interventions to different needs of boys and girls. Moreover, this sample was followed over multiple waves with multiple repeated measurements of disordered eating, depressive symptoms and attachment to both parents and peers, which allowed for an examination of the direction of effects. The four measurement points covered the transition from middle childhood to adolescence, a critical developmental period for the emergence of both disordered eating and depressive symptoms. Finally, sophisticated analytic techniques were used in the three studies. For instance, in Study 1, the application of cross-lagged panels allowed the examination of the bidirectional association between attachment and disordered eating in three separately models for each attachment figure. In Studies 2 and 5, strong and novel analytic approach that took into account time-invariant confounding factors such as genes, common methods effects, stable personality and parenting practices were applied, ruling out therefore their potential impact in the different documented associations.

The two systematic reviews and meta-analyses included in the present Doctoral Thesis (studies 3 and 4) share an undoubtful strength: they were the first studies gathering robust evidence concerning the mediating variables that connect insecure attachment to different attachment figures and EDs symptoms and depression in both clinical and sub-clinical samples at any age and the first ones

performing meta-analytic analyses that measure the effect size of a wide variety of mediators. This knowledge represents a novelty in attachment research and allows the design of better assessments and interventions.

Despite these assets, the results of the present Doctoral Thesis should be interpreted in the context of several limitations.

As regards studies 1, 2 and 5, the first limitation would be the representativeness of the sample. Participants were particularly representative of the region of Galicia (Spain) and predominantly White. In consequence, extrapolating the present results to other countries and cultures should be performed with care as they vary considerably (Cassidy, 2016).

Second, attrition at T4 was relatively high. This higher dropout may be due to the fact that most adolescents had completed compulsory education at this age and hence had left school. Although systematic attrition affecting the results cannot be ruled out, we applied a FIML procedure in the three studies, which produced less biased estimates than complete case analysis (Enders & Bandalos, 2001).

Third, studies relied solely on self-reports from one source. This might explain the high scores of eating symptoms at T1 (ages 10–11) (studies 1 and 5) because children at this age tend to overestimate their eating problems (Decaluwé & Braet, 2004). In studies 2 and 5, however, as the rater did not change over time, any prospective inflation in predictions due to common methods would, in fact, be adjusted for by the latent time invariant factors applied.

Fourth, the impact of various insecure organized (i.e., avoidant and ambivalent) and disorganized attachment patterns remains to be addressed as attachment was examined continuously, not categorically. Notwithstanding, when applying taxometric techniques to a large sample, Fraley and Spieker (2003) found that variation in attachment patterns were continuously rather than categorically distributed. In addition, not only do borderline or mixed cases remain hidden with categorical approaches (Futh et al., 2008), but statistical power is also reduced (Roisman et al., 2007). Consequently, to capture the natural variability in attachment, the present studies

analyzed the quality of attachment relationships, which increased therefore the statistical power and decreased the risk of a Type II error.

Fifth, the measured variables were treated as single manifest constructs; therefore, we were not able to account for error variance in measurement. However, in studies 2 and 5, the error terms of all predictors were allowed to correlate at each time point by using a DPM approach within a structural equation framework (Allison et al., 2017; Bollen & Brand, 2010; Wichstrøm et al., 2017).

Lastly, cross-lagged analyses performed in study 1 did not cover within-person reciprocal processes. However, studies 2 and 5 addressed this issue by applying hybrid models that have the statistical power of random effects models while preserving the fixed effects advantage (which utilizes both within and between subject information) (Firebaugh et al., 2013).

Concerning the two meta-analyses (studies 3 and 4), the first limitation relates to the scarce number of studies in relation to some mediators, so that only a subset of the studies could be included for performing meta-analyses calculations.

Second, the majority of the findings proved in the two meta-analyses were provided by normal population and among young adults, predominantly Caucasian, thus reducing the possibility for generalization; caution is needed, therefore, in extrapolating the results to other sociodemographic groups.

Third, most of the studies were cross-sectional, so from the included data in both meta-analyses it was not possible to draw definitive conclusions regarding the development of the ED and depression. This limitation reflects the need for future studies to implement prospective designs.

Fourth, in study 3, most of the included studies used exclusively Sobel test to prove the significance of mediation despite the fact that this test has been overcome.

Fifth, the heterogeneity of effects between studies in both meta-analyses was considerably high. Nevertheless, as it is claimed by experts, heterogeneity is a characteristic of a particular meta-analysis, not a nuisance (Berlin, 1995). In both meta-analyses, this feature was

not hidden but explored by stratifying the analysis into smaller and, theoretically, more homogenous groups. Although both fixed and random-effects estimates were calculated, we presented random-effects estimates as it might be the most appropriate way to deal with this issue (Higgins, 2008).

Sixth, the mediation ratio (Preacher & Kelley, 2011) used as a summary of the effect size for each mediator suffers from several limitations (Hayes & Rockwood, 2017). However, it should be noted that so far, it is the most widely used measures of effect size for mediation models and a method relatively unaffected by sample size.

Finally, some response biases may have affected the results as most studies relied exclusively on information based on self-reports.

6.3. IMPLICATIONS FOR PRACTICE

The results of the present Doctoral Thesis have important implications for both prevention and intervention.

First of all, based on the results of the empirical studies included in the present doctoral dissertation, building secure attachment relationships with parents and peers, mainly with the mother, may prevent not only the emergence of unhealthy eating behaviors (studies 1 and 5) and depressive symptoms (studies 2 and 5) in adolescents (Faber et al., 2018; Jacka et al., 2013; Sander & McCarty, 2005), but also the subsequent deterioration of parent–child attachment relationships, especially in girls (studies 1 and 2). For instance, the implementation of programs that provide parents with the communication skills necessary to manage conflicts, so that the adolescent's normative process of autonomy is facilitated while the parent–child relationship is preserved (Allen & Tan, 2016).

In addition, as found in Study 1, peer attachment relationships may influence eating behaviors among boys. Consequently, early prevention efforts should consider school settings as well (O'Dea & Maloney, 2000). Programs implemented at school teaching children skills on how to deal with the beauty standards imposed mainly by the media but also through peers and family conversations, has shown beneficial long-term effects for both genders (Warschburger & Zitzmann, 2018).

Although the effect of attachment relationships with parents on disordered eating and depressive symptoms was stronger among 12-14 year-old girls, particularly when considering maternal attachment, this does not rule out the benefit of these programs in boys early on when they show similar risk for developing internalizing symptoms than girls (Madigan et al., 2013) or the importance of also including the father.

Lastly, clinicians should be aware that children who report low quality in their attachment relationships with their mothers are at risk not only for increasing depressive symptoms but also for future development of disordered eating. Consequently, interventions should address maladaptive negative cognitions rooted in dysfunctional

working models that foster the development of negative self-concept in children (Rieger et al., 2010; Stark et al., 2012). Given the fact that during the transition from middle childhood to adolescence, *IWMs* are more open to considerable modifications (Groh et al., 2014) but also increasingly more resistant to change over the course of development (Bowlby, 1973), early interventions should address these dysfunctional working models in order to modify them and to prevent depressive symptoms (study 2) and further development of disordered eating (Study 5).

Concerning the two meta-analyses included in the present Doctoral Thesis, they provided significant evidence of the role that several psychological variables —mainly linked to emotional and cognitive processes—, can play in the association between attachment and eating and depressive symptoms at different developmental periods. Thus, clinicians should include therapeutic strategies focused, not only on the features of attachment, but also on the mediators that maintain and aggravate eating and depressive symptomatology or pose a risk for their possible development (Raynault et al., 2016). For instance, intervening at the level of negative self-representations by improving confidence and to provide skills to better manage negative emotions and interpersonal problems may decrease depressive symptoms (e.g., Morley & Moran, 2011) and the subsequent symptoms of eating disorder such as binge eating, purging or extreme exercise or dieting (Faber et al., 2018; Tasca, 2018).

6.4. FUTURE DIRECTIONS FOR RESEARCH

Our research underscores the prospective influence of attachment relationships on the development of disordered eating and depressive symptoms and *vice versa* in a general sample (Studies 1 and 2). Future studies should expand our research and test our suggested mediational model (Study 5) by targeting different subgroups of interest, such as clinical samples, adults and participants from diverse locations and ethnic backgrounds.

Considering our mediational model based on attachment with the mother, prospective research should also examine whether our findings hold for other attachment figures. Actually, fathers and peers may have different effects on the development of depressive symptoms and disordered eating than attachment to mothers as proven previously (Branje et al., 2010; Goossens et al., 2012; Le Grange et al., 2014).

Future researchers should include different measures, such as clinical interviews for the assessment of eating and depressive symptoms and observational attachment measures. Also, it remains to be ascertained whether different insecure attachment styles relate differently to depression and eating problems.

Finally, there could also be benefitial to include greater consideration of negative and time-variant factors that might moderate the links between attachment and eating and depressive symptoms. After all, the relation between attachment and psychopathology has been found to be reinforced in the context of multiple risk factors (Belsky, 2016).

Based on our meta-analytic evidence, it is necessary to implement prospective designs that include a temporal sequence ascertaining the precedence of the independent variable on the mediator and, likewise, of the mediator on the dependent variable (Lee et al., 2015). Future studies should test these models with clinical samples and with children and adolescents.

It would be interesting to explore the interplay among the different identified mediators in these reviews through sequential multiple mediation models and moderated mediation models to

understand the contribution of each mediator, as they might be connected.

Moreover, future mediation studies should apply powerful statistical techniques such as SEM with bootstrapping in order to strengthen conclusions and reporting the magnitude of the mediated effect.

Additionally, it will be useful to differentiate whether the mediational effects of such variables differ by specific diagnoses of ED (bulimia vs. anorexia symptoms) and also by age distribution (children/adolescents vs. adults).

Future research should apply other observational measures of attachment as the majority of studies were based on self-report measures. In this regard, as recommended by attachment researchers, the Adult Attachment Interview (AAI) is acknowledge as the gold standard measure for adult samples (Main et al., 1985), and the Child Attachment Interview (CAI; Shmueli-Goetz et al., 2008) has shown the best psychometric properties for children and adolescent populations (Jewell et al., 2019).

Finally, the control for confounding variables (time-invariant and time-variant factors) merits particular attention to rule out possible spurious effects (Fowkes & Fulton, 1991).

VII. CONCLUSIONS

7. CONCLUSIONS

The present work was devoted to a better understanding of the reciprocal associations between attachment relationships (mother, father, peers) and eating and depressive symptoms in the transition from middle childhood to adolescence and of the main mediators that govern such associations. From the results obtained in these studies and the discussion, it is concluded that:

- The quality of attachment relationships with parents, particularly with the mother, remains important vis à vis disordered eating (i.e., positive attachment to parents, primarily the mother, leads to less eating problems). In addition, fathers also seem to be a source of security and comfort among early adolescent boys who report more disordered eating. The presence of eating symptoms erodes mother-child relationships, essentially in girls (study 1).
- Poor attachment relationships with parents predict prospective depressive symptoms in middle childhood and adolescence, even when all time-invariant confounders are adjusted for. Moreover, depressive symptomatology has a detrimental effect on attachment relationships over time, particularly with the mother. Better attachment relationships with the mother are particularly protective against future depression, and these attachment relationships are likely more important to girls' depressive symptoms than boys' (study 2).
- Parents serve unique and primary attachment-related functions in adolescence: secure base, proximity seeking, safe haven and separation distress. The attachment relationships established with parents can be differentiated from other supportive social relationships such as with peers. In fact, peers are likely to be sought out for emotional support in contexts involving daily stressors or non-emergency challenge that occur when parents are physically inaccessible, especially in girls. Premature peer attachment relationships in boys might increase the risk for disordered eating, however, this association needs to be further explored. Overall, mothers have proven to be identified as the

primary attachment figure vis à vis psychopathology and they are especially relevant for girls (studies 1 and 2).

- Depressive symptoms, emotion dysregulation, body dissatisfaction, maladaptive perfectionism, neuroticism, low mindfulness and social comparison could be considered as essential psychological mechanisms for explaining the pathways through which insecure attachment may increase the vulnerability to eating disorder symptoms. Depressive symptoms and emotional dysregulation yielded the strongest effect size (study 3).
- The link attachment-depression might be explained by the mediational effect of cognitive-emotional processes such as, on the one hand, dysfunctional attitudes, self-criticism and low self-compassion, and on the other hand, related to emotion dysregulation strategies, cognitive hyperactivating strategies, and more precisely, brooding rumination (study 4).
- Insecure attachment relationships with the mother have also the potential to predict the development of disordered eating via depressive symptoms in the transition from middle childhood to adolescence in boys and girls, even when controlling initial levels of depressive and eating symptoms, the quality of attachment and the invariant confounders over time (study 5).
- At prevention level, programs for parents promoting communication and conflict management skills, and stability in relationships with their sons and daughters could be effective in reducing the risk of depression and eating disorders. At intervention level, attachment-based treatments should address negative cognitions about oneself and others, probably rooted in early mental schemas, that foster a negative point of view of reality, difficulties regulating emotions and problematic interpersonal functioning in boys and girls. This intervention could disrupt the mediational chain whereby insecure attachment leads to eating problems.

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IX. SUMMARY IN SPANISH (RESUMEN)

1. INTRODUCCIÓN

La adolescencia es una de las etapas más desafiantes de la vida, por los numerosos y significativos cambios que entraña a nivel neurobiológico, afectivo, cognitivo y social (p. ej., Crosnoe y Johnson, 2011). En este contexto de transformaciones, las relaciones sociales empiezan a cambiar y se expanden, niños y niñas comienzan a pasar menos tiempo con sus padres y más con sus iguales (Rudolph, 2009). Este proceso de socialización demanda nuevas competencias para explorar y dominar entornos diferentes (Kerns y Brumariu, 2016) y requiere del equilibrio entre los recursos personales e interpersonales (Rudolph, 2009). Al mismo tiempo, se desarrolla una mayor autosuficiencia emocional frente a los padres y una mayor cercanía con los iguales, aunque preservando las relaciones con sus figuras primarias (Allen y Tan, 2016; Rosenthal y Kobak, 2010). Esta compleja metamorfosis proporciona un escenario de potencial riesgo para la aparición de problemas de salud mental, especialmente en jóvenes con una capacidad limitada para enfrentar los numerosos desafíos que plantea la adolescencia (Casey et al., 2008; Lerner y Steinberg, 2004). De este modo, no es de extrañar que se hallen incrementos notables de diferentes formas de psicopatología al inicio de la adolescencia, incluidos los trastornos de la conducta alimentaria (TCA) (Smink et al., 2012) y la depresión (Hankin et al., 2015; Thapar et al., 2012). Ambos trastornos interfieren significativamente en el desarrollo psicosocial, provocando gran sufrimiento entre los adolescentes (Smink et al., 2012; Thapar et al., 2012). Por lo tanto, es crucial identificar los factores de riesgo que contribuyen al desarrollo de tales psicopatologías, ya que su detección temprana podría mejorar tanto su prevención como su tratamiento.

Es conocido que tanto los TCA (Smink et al., 2012) como la depresión (Greenberg et al., 2015) suelen emerger al inicio de la adolescencia, particularmente en las mujeres. Los TCA están asociados con deterioro en el bienestar social, emocional y funcional,

altas tasas de persistencia y recurrencia (Klein y Walsh, 2004), y a menudo van acompañados de complicaciones médicas graves (Klump et al., 2009). Presentan elevados índices de mortalidad, así como de suicidio (Ágh et al., 2016; Arcelus et al., 2011); de hecho, la anorexia nerviosa (AN) tiene el registro de mortalidad más elevado de todos los trastornos psiquiátricos (Arcelus et al., 2011). Por su parte, la depresión es un trastorno frecuente, recurrente y grave que no conoce fronteras y que produce enormes costes socioeconómicos (Greenberg et al., 2015; Kessler, 2012). Los adolescentes que han experimentado trastornos depresivos tienen un alto riesgo de recaída y problemas emocionales recurrentes en la edad adulta (Cicchetti y Toth, 2009).

Cabe destacar que muchos adolescentes experimentan formas subclínicas de TCA (como dietas extremas, ayuno, vómitos y/o uso de laxantes para perder peso; Ackard et al., 2011; Chamay-Weber et al., 2005; Neumark-Sztainer et al., 2011) y depresión (p. ej., Carrellas et al., 2017; Wesselhoeft et al., 2013) que les generan un menoscabo psicológico similar, en muchos casos, al que se deriva de los diagnósticos clínicos (Ayuso-Mateos et al., 2010; Stice et al., 2009). A la par que el notable aumento de estas psicopatologías en la transición a la adolescencia, es llamativo el incremento desproporcionado que se produce en las niñas en relación con los niños (Ferreiro et al., 2012; Measelle et al., 2006). Como señaló hace décadas McCarthy (1990), los paralelismos en las características de género de los trastornos alimentarios y depresivos probablemente no son casuales. Curiosamente, ambos trastornos son altamente comórbidos, particularmente en las mujeres (Blinder, Cumella, & Sanathara, 2006), lo que sugiere que están compartiendo factores de riesgo comunes (Green et al., 2009), algunos de los cuales podrían contribuir a la observada brecha de género (Ferreiro, Seoane y Senra, 2011). Aunque el examen de la distribución desigual de estas alteraciones por género escapa a los objetivos de esta tesis, no puede obviarse que es una característica que afecta transversalmente a las trayectorias del desarrollo y a sus formas de manifestación (Ferreiro et al., 2012, 2014; Measelle et al., 2006). Así pues, la transición a la adolescencia representa un período idóneo para investigar el desarrollo de ambos trastornos y los procesos subyacentes que

podrían, además, ayudar a entender las diferencias de género. La complejidad del estudio que se propone exige modelos amplios, recíprocos y dinámicos capaces de dilucidar las relaciones transaccionales entre los diferentes factores de riesgo involucrados en estas psicopatologías. Una mayor comprensión, en última instancia, respaldará el desarrollo de enfoques de tratamiento con apoyo empírico, así como la creación de programas de prevención efectivos para aquellos niños y adolescentes que sufren o corren el riesgo de padecer síntomas alimentarios y/o depresivos.

La teoría del apego de Bowlby es un marco de partida sólido para comprender cómo la calidad de las relaciones tempranas de apego puede influir en el desarrollo y mantenimiento de la psicopatología alimentaria y depresiva (Morley y Moran, 2011; Tasca, 2018). Desde la óptica del apego, los niños desarrollan representaciones mentales de sí mismos y del mundo basados en ese primer entorno de cuidados (Internal Working Models, IWMs) que tendrán implicaciones importantes para su futuro funcionamiento psicosocial (Bowlby, 1973). Cuando los niños con apego seguro se enfrentan a situaciones estresantes, pueden indicar abiertamente sus necesidades y activar estrategias adaptativas de regulación emocional. El resultado final es una sensación de eficacia emocional que a su vez les permite tener la confianza necesaria para explorar nuevas situaciones y reducir el miedo y la angustia (DeKlyen y Greenberg, 2016; Gentzler et al., 2010). Al contrario, las experiencias de cuidados inconsistentes o no disponibles socavan la capacidad de los niños para confiar en los padres como refugio seguro y dan lugar a IWMs más rígidos y autocríticos (Belsky, 2016; Mikulincer & Shaver, 2012). Así, es probable que los niños que carecen de un modelo de apego seguro usen estrategias de regulación emocional menos adaptativas ante situaciones estresantes, como la tendencia a mantenerse alejados emocionalmente de los demás y restringir sus emociones por temor al rechazo (apego evitativo) o, por el contrario, a aferrarse emocionalmente a los demás y buscar su cercanía por temor al abandono (apego ansioso), aumentando el riesgo de psicopatología (Gentzler et al., 2010).

Numerosos estudios han investigado la asociación entre la calidad negativa del apego y el desarrollo posterior de psicopatología alimentaria y depresiva, suponiendo la continuidad en los IWMs desde la infancia hasta la edad adulta (Kobak et al., 2017; Kobak y Zajac, 2011). Sin embargo, es probable que tanto el significado como la expresión de las cogniciones, conductas y emociones derivadas del apego experimenten cambios profundos en la adolescencia (Allen & Tan, 2016). Algunos estudiosos del apego consideran que las representaciones tempranas se revisan y actualizan a la luz de la experiencia y, en consecuencia, pueden corresponderse o no con representaciones de apego posteriores (Cassidy et al., 2013; Fraley, 2002). De hecho, los estudios que han examinado los correlatos del cambio desde la infancia hasta la adolescencia han encontrado una continuidad modesta (Groh et al., 2014; Hamilton, 2000; Pinquart et al., 2013; Weinfield et al., 2004). Por consiguiente, hay un amplio margen para cuestionar la fortaleza de los efectos de un apego temprano a lo largo del tiempo, particularmente durante este período de transición. Dada la posible condición maleable de los IWMs, es plausible suponer que la sintomatología alimentaria y depresiva también pudiera empeorar la calidad de las relaciones de apego. Sin embargo, no se ha examinado hasta el momento la influencia inversa. Como tal, se sigue manteniendo la incógnita de si las relaciones de apego inseguras son la causa y/o consecuencia de la psicopatología alimentaria y depresiva.

Otro aspecto de interés, relacionado con lo anterior, es el papel que juegan las distintas figuras de apego en la transición a la adolescencia. Bowlby reconoció la existencia de una jerarquía de apego que varía a lo largo del desarrollo y que incluye a otras personas, además de los cuidadores primarios, (Kerns y Brumariu, 2016; Zeifman y Hazan, 2016). Algunos autores sostienen que los padres siguen siendo las principales figuras hasta el final de la adolescencia, específicamente, la madre es la preferida en momentos de estrés y necesidad de seguridad y apoyo (Markiewicz et al., 2006). Sin embargo, durante la infancia media y adolescencia, niños y niñas desarrollan relaciones más estrechas con sus compañeros y recurren cada vez más a ellos para obtener consuelo y apoyo emocional (Allen

& Tan, 2016). Por otro lado, el comportamiento con las figuras de apego puede ser diferente en función del género. Por ejemplo, en momentos de dificultad, las niñas tienden a estrechar la relación con los padres (especialmente con las madres) y a buscar apoyo emocional en los demás, mientras que los niños tienden a disminuir su dependencia de los padres a medida que crecen y a restringir las emociones y/o no compartirlas con ellos (Allen y Tan, 2016). Cabe suponer, por tanto, que el apego a los padres y a los compañeros puede contribuir de manera diferencial en la evolución de las alteraciones alimentarias y depresivas en niñas y niños. En consecuencia, comprender la naturaleza específica de tales asociaciones puede tener importantes implicaciones prácticas.

Desde un punto de vista metodológico, es importante tener en cuenta que existe una gran variedad de posibles factores de confusión que podrían influir en las variables diana, produciendo relaciones espurias entre ellas. Por ejemplo, factores como una genética común (Berrettini, 2004; Trace, Baker, Peñas-Lledó y Bulik, 2013), temperamento o rasgos de personalidad (Cassin y von Ranson, 2005), crianza problemática (DeKlyen y Greenberg, 2016; Striegel-Moore et al., 2005) y/o sesgos de estilo de respuesta (Decaluwé y Braet, 2004), e incluso otros muchos que actualmente desconocemos. Tales factores, a menudo difíciles de medir, hacen que las interpretaciones de la investigación observacional sean inciertas. Ante tales inconvenientes, el uso de modelos de panel dinámico (DPM) (Bollen y Brand, 2010; Wichstrøm, Belsky y Steinsbekk, 2017) permite descartar una importante fuente de confusión referida a los factores invariantes, es decir, aquellos que no cambian su valor con el tiempo, independientemente de si se miden o no. A pesar de que los DPM reducen la brecha entre la mera predicción y la causalidad, factores que varían en el tiempo (p. ej., eventos vitales estresantes) [Jacobi, Hayward, de Zwaan, Kraemer y Agras, 2004; Striegel-Moore et al., 2005]) aún podrían producir una relación falsa entre apego inseguro y síntomas alimentarios y depresivos. Sin embargo, muchos de estos factores también han mostrado cierta estabilidad (p. ej., eventos normativos en el desarrollo [Rudolph, 2009], acoso escolar [Scholte, Engels, Overbeek, de Kemp y Haselager, 2007]), lo que a su vez se

podría contemplar a través del DPM, descartando así parte de los obstáculos en la interpretación de los resultados. No obstante, hasta la fecha, ninguna investigación ha aplicado DPM para probar las relaciones entre apego inseguro y psicopatología.

Además, para avanzar en el conocimiento de manera sustancial, es importante tener en cuenta que el apego inseguro, aunque esencial, puede que sea uno más de los factores que influyen en el desarrollo de la psicopatología (Cicchetti, Toth y Lynch, 1995, p.59). De hecho, en la mayoría de los casos, el apego inseguro se relaciona con la psicopatología gracias al concurso de variables intermedias que actúan como mediadoras (DeKlyen y Greenberg, 2016). Precisamente, este es el caso de los TCA (Tasca y Balfour, 2014) y la depresión (Morley y Moran, 2011). En este sentido, una línea emergente de investigación en este campo se dirige a la identificación de los factores que pueden explicar cómo el apego podría conducir a síntomas clínicos (Brumariu y Kerns, 2010). La respuesta a esta pregunta no solo contribuirá a una mejor comprensión del papel desempeñado por ciertos factores en el desarrollo y mantenimiento de los TCA y la depresión, sino que también proporcionará evidencia empírica para la formulación de nuevas hipótesis a la luz de las teorías existentes.

Aunque ha habido un volumen significativo de investigación sobre la asociación entre el apego inseguro y el desarrollo de síntomas alimentarios y depresivos en niños y adolescentes (Jewell et al., 2016; Kerns y Brumariu, 2016), apenas se ha cuestionado el papel predictor del apego inseguro en la psicopatología, particularmente entre los adolescentes. Además, la mayoría de los estudios prospectivos se han basado en el supuesto inexacto de un efecto directo y unidireccional entre el tipo de apego y los síntomas (DeKlyen y Greenberg, 2016). En consecuencia, es prioritario investigar: (a) la posibilidad de que la psicopatología también pueda erosionar la calidad de las relaciones de apego (efecto inverso), y (b) los efectos mediadores de diferentes variables, teniendo en cuenta el impacto que puedan introducir posibles factores de confusión en estas asociaciones.

Como se ha comentado, la literatura previa se ha centrado casi exclusivamente en el apego madre-hijo, a pesar de la amplia evidencia

sobre la importancia del padre y el grupo de iguales en el funcionamiento psicosocial de los adolescentes. También se desconoce de momento el potencial efecto moderador que puede tener el género en estas asociaciones. El hecho de que los síntomas alimentarios y depresivos se aparezcan a edades cada vez más tempranas y se manifiesten de diferentes maneras según el género, invita a aclarar cómo la calidad del apego a diferentes figuras puede influir de manera diferencial en el desarrollo de los síntomas depresivos y alimentarios en niños y niñas.

Teniendo en cuenta el estado de la cuestión, la presente tesis aspira a dar respuesta a las principales preguntas que en este momento siguen sin resolver.

2. OBJETIVOS

El **objetivo general** de la presente tesis fue examinar la asociación recíproca entre la calidad de las relaciones de apego (madre, padre y compañeros, por separado) y los síntomas alimentarios y depresivos en el tránsito a la adolescencia, identificar las principales variables mediadoras que explican tales asociaciones y averiguar cómo interaccionan. Este objetivo general se puso en práctica a través de la formulación de los siguientes **objetivos específicos**:

1. Explorar las asociaciones recíprocas entre la calidad del apego (madre, padre, iguales), más allá del impacto de la sintomatología preexistente, desde la infancia hasta la adolescencia, e indagar si tales relaciones difieren según la figura de apego en niños y niñas.
2. Investigar las asociaciones recíprocas entre el apego inseguro al padre y a la madre y los síntomas depresivos, más allá del impacto de la sintomatología preexistente y posibles factores de confusión invariantes en el tiempo, desde la infancia media hasta la adolescencia; y analizar si tales relaciones varían en función del género de los padres, de los hijos y del período evolutivo.

3. Identificar los principales mediadores a través de los cuales el apego inseguro confiere vulnerabilidad al desarrollo de síntomas alimentarios y cuantificar el tamaño del efecto de cada uno de ellos.
4. Identificar los principales mediadores a través de los cuales el apego inseguro confiere vulnerabilidad al desarrollo de síntomas depresivos y cuantificar el tamaño del efecto de cada uno de ellos.
5. Explorar si los síntomas depresivos son la vía a través de la cual el apego inseguro a los padres favorece el desarrollo de síntomas alimentarios en la transición de la infancia a la adolescencia, incluso después de ajustar los niveles iniciales de síntomas depresivos y alimentarios, apego y los factores invariantes en el tiempo; y examinar si los efectos son recíprocos y si difieren según el género de padres e hijos.

3. MÉTODO

En la presentación de esta sección, primero se expondrán los apartados correspondientes a los estudios empíricos (estudios 1, 2 y 5) y, a continuación, la estrategia seguida para los metaanálisis (estudios 3 y 4).

3.1. ESTUDIOS EMPÍRICOS

3.1.1. Participantes

La Figura 1 ilustra el flujo de participantes del reclutamiento. La muestra inicial (N= 954) fue reclutada en diferentes colegios públicos y concertados, seleccionados al azar mediante estratificación por zonas geográficas en la provincia de A Coruña (Galicia). De los 15 colegios contactados, tres declinaron participar. Al inicio del estudio (T1), la muestra estaba compuesta por 904 estudiantes (465 niñas y 477 niños; M_{edad} = 10.83; *SD* = 0.75). Estos escolares fueron posteriormente contactados cada dos años en tres ocasiones para ser

reevaluados: en el Tiempo 2 (T2) 880 adolescentes (434 niñas y 446 niños; M_{edad} = 12.85; *SD* = 0.77), en el Tiempo 3 (T3) 738 participantes (373 niñas y 365 niños; M_{edad} = 14.98; *SD* = 0.84), y en el Tiempo 4 (T4) 473 adolescentes (244 niñas y 229 niños; M_{edad} = 16.40; *SD* = 0.82).

El nivel educativo de los padres (según el nivel más alto de cualquiera de los padres) fue: 68% educación primaria, 20% educación secundaria y 12% educación superior. La composición étnica de la muestra fue 98% caucásica, 1% árabe y 1% "otros", lo que es consistente con el desglose étnico relativamente homogéneo de la población de referencia (Instituto Galego de Estatística, 2017).

3.1.2. Instrumentos de evaluación

- Cuestionario de actitudes alimentarias anómalas en los niños (*Children Eating Attitudes Test, ChEAT*; Maloney et al., 1988). El *ChEAT* es un autoinforme de 26 ítems que evalúa las actitudes y comportamientos alimentarios disfuncionales de niños y adolescentes. Cada ítem se califica en una escala de 6 puntos que varía de 1 (siempre) a 6 (nunca) y se puntúa de 0 a 3. La puntuación total va de 0 a 78. La versión en español del *ChEAT* utilizada en este estudio ha demostrado consistencia interna y validez concurrente satisfactorias (Senra et al., 2007). A lo largo del presente estudio, los coeficientes α oscilaron entre .85 y .90 (ver Appendix 2).
- Inventario de depresión infantil (*Children Depression Inventory, CDI*; Kovacs, 1992). El *CDI* es un autoinforme de 27 ítems diseñado para cuantificar los síntomas depresivos en niños y adolescentes. Cada ítem tiene tres opciones de respuesta que puntúan 0 (ausencia de sintomatología), 1 (sintomatología leve) o 2 (sintomatología severa). La versión española utilizado en este estudio ha demostrado propiedades psicométricas adecuadas (Del Barrio Gandara et al., 1999) La puntuación total varía de 0 a 54. En la muestra actual, los coeficientes α variaron de .84 a .86 (ver Appendix 2).

- Inventario de apego de padres y compañeros (*Inventory of Parent and Peer Attachment, IPPA*; Armsden y Greenberg, 1987). El *IPPA* es un autoinforme que evalúa las percepciones de los niños/as sobre la calidad del apego hacia la madre, el padre y los compañeros. En el presente estudio, utilizamos las subescalas de apego hacia los padres (madre y padre) de 25 ítems cada una, y la subescala de apego hacia los iguales de 21 ítems, calificadas en una escala de 5 puntos (de 1 = nunca a 5 = siempre). La versión en español del *IPPA* (Pardo et al., 2006) utilizada en este estudio ha mostrado una consistencia interna y validez concurrente satisfactorias. En nuestra muestra, los coeficientes α variaron de .72 a .95 (ver Appendix 2).

3.1.3. Procedimiento

Esta investigación recibió la aprobación del Comité de Bioética de la Universidad de Santiago de Compostela y del Gobierno Regional de Galicia. Además, se obtuvo permiso de los directores de los centros (ver Appendix 4), y el consentimiento informado de los padres de los estudiantes que participaron de forma voluntaria (ver Appendix 5). Como gratificación por la colaboración en el estudio, se sortearon cinco ordenadores portátiles y cuatro *tablets* en T3 y T4, respectivamente. El proceso de cumplimentación se llevó a cabo en clases con 20-25 estudiantes. Se informó de que el propósito de la investigación era explorar los factores de protección y de riesgo asociados con el bienestar de los jóvenes, se les dieron instrucciones para completar los cuestionarios y se insistió en el carácter confidencial de la información. Dos psicólogas permanecieron en el aula durante las evaluaciones para aclarar posibles dudas y prevenir que los estudiantes hablasen entre ellos.

3.1.4. Análisis estadísticos

Los análisis descriptivos se llevaron a cabo utilizando *IBM SPSS Statistics* 24. Para ejecutar Modelos de Ecuaciones Estructurales (SEM) se utilizó *Mplus* (Muthén y Muthén, 1998–2018), versiones 7 y 8.1 para el estudio 1 y 2, respectivamente. Se aplicó la estimación

de máxima verosimilitud (*Full Information Maximum Likelihood Estimation*; FIML) para el tratamiento de datos *missing*.

Estudio 1

Se examinaron las relaciones recíprocas entre los síntomas alimentarios y la calidad del apego a cada figura (madre, padre e iguales) mediante tres modelos diferentes). Se usó la prueba de *Chi-cuadrado* para conocer el efecto moderador del género. Se utilizaron pruebas de *Wald* para identificar diferencias en los coeficientes de regresión individuales. Además, se tomaron las siguientes medidas absolutas de ajuste para determinar el grado en el que el modelo globalmente predice la matriz de datos inicial: raíz cuadrada del error cuadrático medio (*root mean squared error of approximation*; RMSEA) ≤ .08, índice de ajuste comparativo (*comparative fit index*; CF) ≥ .95, índice de Tucker-Lewis (*Tucker-Lewis index*; TLI) ≥ .95 y el residuo cuadrático medio estandarizado (*standardized root mean residual*; SRMR) ≤ .10 (Schermelleh-Engel et al., 2003).

Estudio 2

Primero, se investigó, a través de un modelo tradicional autorregresivo *cross-lagged*, si el el apego inseguro a los padres predecía síntomas depresivos y viceversa, controlando el nivel previo de síntomas depresivos. A continuación, se creó un Modelo de Panel Dinámico (*Dual Path Model*; *DPM*) para descartar todos los factores de confusión invariantes en el tiempo (*unmeasured time-invariant confounders*). Se probaron tres modelos diferentes. Un DPM de efectos fijos (*fixed effects*) en el que los efectos de la variable predictora que varía en el tiempo (ej., el apego) se ajusta con el efecto de los factores de confusión invariantes en el tiempo, utilizando la variación intra persona (*within-person variation*), es decir, los participantes sirven como su propio control. Un DPM de efectos aleatorios (*random effects*) en el que se utiliza información intra e inter personas (*within and between person information*) y, por lo tanto, tiene más poder estadístico que un modelo de efectos fijos. Sin embargo, asume que la variable predictora (apego) no está

correlacionada con los factores invariantes en el tiempo. Un modelo híbrido (*hybrid model*), que conjugar las ventajas de los efectos fijos y aleatorios (Firebaugh et al., 2013). Es decir, permite que algunos predictores estén configurados para correlacionarse con los factores invariantes en el tiempo, mientras que otros predictores no lo están (Allison, 2009; Bollen & Brand, 2010; Firebaugh et al., 2013). Se usó la prueba *Satorra-Bentler scaled* $\Delta\chi 2$ *test* (Satorra, 2000), para decidir qué modelo es el que mejor se ajusta.

Estudio 5

Se utilizó el *DPM* en un marco de ecuaciones estructurales (Allison et al., 2017; Bollen & Brand, 2010; Wichstrøm et al., 2017). En la parte autorregresiva tradicional *cross-lagged*, el apego, los síntomas alimentarios y depresivos, medidos durante los últimos tiempos de evaluación (T3 y T4), fueron correlacionados entre sí dos años antes (T1 y T2). Igualmente, se permitió que los errores de todos los predictores se correlacionaran en cada punto de tiempo. Los factores invariantes en el tiempo consistieron en tres factores latentes que se cargaron en las tres construcciones en los últimos tres tiempos, mientras que se correlacionaron con todos los valores iniciales, que se consideraron exógenos. Además, y al igual que en el Estudio 2, se ejecutaron tres *DPM* diferentes. Para probar si un modelo híbrido no deterioraba el ajuste, se usó la prueba de Chi-cuadrado de Satorra-Bentler (Satorra, 2000), y se comparó con un modelo de efectos fijos. Para explorar la potencia de la mediación, se ajustaron todos los efectos directos en el modelo. De modo que, se examinó la posible influencia del apego inseguro a los 10 años sobre los síntomas alimentarios a los 16 años a través del efecto de los síntomas depresivos a los 12 y 14 años, ajustando los efectos directos del apego y de los síntomas depresivos a los 12 años, así como el efecto directo de la edad. Se aplicaron intervalos de confianza asimétricos a 1000 *bootstrapped*.

3.2. METAANÁLISIS

Tanto el protocolo para las revisiones como los metaanálisis se registraron en PROSPERO: Registro prospectivo internacional de revisiones sistemáticas (CRD42017079626 y CRD42017076807). Ambas revisiones siguieron la guía PRISMA (Moher et al., 2009) (ver Appendix 6).

3.2.1. Estrategia de búsqueda

Se realizaron búsquedas sistemáticas exhaustivas en *Medline, Pubmed, PsycINFO y EMBASE* y, además, en *Conference Proceedings Citation Index-Science (CPCI-S) y Social Science & Humanities (CPCI-SSH) y ProQuest Dissertations & Theses Global*. También se examinaron las Referencias de los estudios incluidos. Para cada estudio, se establecieron dos estrategias de búsqueda con palabras clave precisas que se pueden encontrar en el apartado de Método de la presente tesis (4.3.1. *Search strategy*, p. 32).

3.2.2. Criterios de inclusión / exclusión

Se cumplieron los siguientes criterios de inclusión: (1) publicados antes de enero de 2019 y marzo de 2019 en el caso de síntomas alimentarios y depresivos, respectivamente; (2) sólo estudios empíricos que informaran sobre el efecto de los mediadores entre apego (hacia el padre, la madre y los compañeros o la pareja romántica) y síntomas; (3) estudios que realizaron análisis de mediación; (4) estudios con participantes de cualquier edad de muestras clínicas y subclínicas, y (5) artículos escritos en inglés, español, alemán o francés.

Los pacientes con otras enfermedades significativas o trastornos mentales fueron excluidos. También se excluyeron otras revisiones y metaanálisis.

3.2.3. Selección de los estudios

La autora de la tesis realizó el cribado preliminar de los estudios y, junto con otra investigadora, se revisaron todos los títulos y resúmenes y se examinaron de forma independiente cada artículo

completo. Las razones para la exclusión de los textos completos se registraron y documentaron en un diagrama de flujo PRISMA.

3.2.4. Extracción de datos

Los datos extraídos fueron verificados adicionalmente de forma independiente por un tercer investigador. Los datos de extracción incluyeron todas las características descriptivas de los estudios. Los desacuerdos respecto a los datos extraídos, se resolvieron mediante consenso. En algunos casos, para obtener los datos no publicados, se envió una solicitud por correo electrónico a los autores, hasta tres correos antes de descartar el estudio.

3.2.5. Análisis de síntesis de datos.

Para realizar los análisis se utilizó el software *Comprehensive Meta-analysis* (*CMA*). Primero, se calculó el tamaño del efecto de todos mediadores y, después, estos índices se compararon según: tipo de muestra (clínica vs. no clínica), tipo de apego (ansioso vs. evitado), género (mujer vs. hombre), edad (niños vs. adolescentes vs. adultos) y calidad del estudio (bajo vs. alto). El análisis por subgrupos de mediadores sólo se realizó cuando había más de 2 estudios disponibles por mediador. Para cada análisis, se utilizaron los coeficientes de regresión estandarizados (β) o, en su defecto, r (coeficiente de correlación de Pearson) (Peterson y Brown, 2005), y los tamaños de las muestras para calcular los efectos indirectos ($a * b$) y totales (*path c*) (Hayes y Rockwood, 2017). En los casos en que los estudios presentaban sus resultados en forma de coeficiente de regresión no estandarizado, se calculó β ($\beta = B * [Sx / Sy]$) (Bring, 1994). Para proporcionar un resumen de cada modelo de mediación, se halló el *mediation ratio* (Ditlevsen et al., 2005) del efecto indirecto agrupado y del efecto total agrupado ($PM = ([a * b / c])$ (Shrout & Bolger, 2002). La heterogeneidad se evaluó mediante el estadístico I^2 y se asignaron umbrales de 25%, 50% y 75% para indicar heterogeneidad baja, moderada y alta, respectivamente. Se calcularon los efectos fijos y aleatorios, pero sólo se presentaron estos últimos cuando la heterogeneidad era de superior a moderada (> 50%).

El sesgo de publicación se evaluó visualmente a través de gráficos (*funnel plots*) en el estudio 3 y pruebas de *Egger* (Egger et al., 1997) en ambos metaanálisis (estudios 3 y 4). También se realizaron análisis de sensibilidad, recalculando las estimaciones agrupadas en condiciones extremas.

3.2.6. Calificación de calidad

La calidad de los estudios se evaluó con la herramienta desarrollada originalmente por Lee et al. (2015), adaptada por Cortés-García et al. (2019) a los efectos de los presentes estudios (see Appendix 7). Cada estudio se calificó de forma independiente proporcionando una puntuación de 1 (sí) o 0 (no) a cada uno de los 10 ítems. Los estudios se clasificaron en débiles (puntuación de 0-3), moderados (puntuación de 4-6) y fuertes (puntuación de 7-9) según estos criterios. Los desacuerdos entre investigadores se resolvieron mediante consenso. Además, se realizó un análisis agrupado que comparó estudios de baja calidad (puntuaciones <5) con estudios de calidad moderada a alta (puntuaciones ≥ 5).

4. RESULTADOS

4.1. ESTUDIO 1: EXPLORANDO LAS RELACIONES RECÍPROCAS ENTRE LAS PERCEPCIONES DE APEGO DE LOS ADOLESCENTES A LOS PADRES Y LOS IGUALES Y SÍNTOMAS ALIMENTARIOS: UN ANÁLISIS MULTI-ONDA CON CROSS-LAGGED PANEL.

Con respecto al apego a la madre, los resultados mostraron que mejor calidad de apego con la madre de 10 a 12 años protege frente al desarrollo de síntomas alimentarios de 12 a 14 años, en niños y en niñas, aunque en las niñas estos efectos fueron más robustos. Además, en las niñas, mayor presencia de síntomas alimentarios a los 14 años predijo un peor apego a la madre a los 16 años. En relación con el padre, un mejor apego al padre a los 10 años predijo menos síntomas alimentarios dos años más tarde en las niñas. En los niños, más síntomas alimentarios a los 10 años predijeron un mejor apego al padre dos años después. Con respecto al apego con los iguales, se

encontró que una mejor calidad de apego a los 10 años predijo más síntomas alimentarios a los 12 años, pero este efecto sólo se dejó sentir en los niños.

4.2. Estudio 2. Asociaciones prospectivas bidireccionales entre apego y síntomas depresivos desde la infancia media hasta la adolescencia

Las relaciones de apego inseguras a ambos progenitores revelaron un aumento de síntomas depresivos de los 10 a los 14 años, particularmente, entre las niñas y, a su vez, los síntomas depresivos también deterioraron la percepción de las relaciones de apego desde los 12 a los 16 años. El apego inseguro a la madre a los 12-14 años, demostró tener una influencia mayor en el desarrollo de síntomas depresivos que el apego inseguro al padre, e inversamente, los síntomas depresivos erosionaron en mayor medida la calidad de apego con la madre que con el padre entre los 14 y los 16 años.

4.3. Estudio 3. Mediadores que conectan apego inseguro y síntomas alimentarios: Revisión sistemática y meta-análisis

La desregulación emocional y los síntomas depresivos reflejaron el mayor tamaño del efecto en la mediación (*PM* = 0,71). Además, la insatisfacción corporal, el neuroticismo, el perfeccionismo, el *mindfulness* y la comparación social arrojaron índices mediadores significativos, pero de moderados a bajos (*PM* = 0.21-0.58).

4.4. Estudio 4. Mecanismos mediadores involucrados en la relación entre apego inseguro y depresión: Un meta-análisis

La evidencia meta-analítica mostró que las actitudes disfuncionales (*β = 0.10, IC 95% = 0.01 a 0.20*), la autocrítica (*β = 0.17, IC 95% = 0.04 a 0.28*), la baja autocompasión (*β = 0.16, 95% IC = 0.02 a 0.29*), las estrategias cognitivas hiperactivas de regulación emocional (*β =*

0.13, IC 95% = 0.05 a 0.20), como el pensamiento repetitivo (β = 0.17, IC 95% = 0.07 a 0.28), y particularmente, la rumiación *brooding* (*β = 0.20, IC 95% = 0.07 a 0.32*) mediaron la asociación entre el apego inseguro y los síntomas depresivos. Los efectos indirectos solo fueron significativos en muestras con adultos.

4.5. Estudio 5. Rol mediador de los síntomas depresivos conectando apego inseguro y síntomas alimentarios en adolescentes: Un estudio longitudinal multi-onda

Se encontró que una peor percepción de la calidad de apego a la madre de 10 a 12 años predijo el desarrollo de síntomas alimentarios de 14 a 16 años, a través del efecto de los síntomas depresivos de 12 a 14 años, tanto en niños como en niñas. No se encontraron efectos inversos de mediación. Este estudio pone de manifiesto que los síntomas depresivos pueden ser un mecanismo clave para explicar cómo el apego inseguro a la madre influye en el desarrollo posterior de sintomatología alimentaria en la adolescencia.

5. DISCUSIÓN GENERAL

En general, y como se esperaba, una mejor calidad del apego a la madre protegió frente al desarrollo posterior de síntomas alimentarios, tanto en niños como en niñas (estudio 1). Cabe destacar, que esta influencia tuvo lugar en diferentes momentos a lo largo del seguimiento de seis años. Además, hubo un efecto recíproco de los síntomas alimentarios en la calidad de las relaciones de apego con la madre, sólo entre las niñas.

En más detalle, nuestros hallazgos sobre la influencia protectora del apego a la madre frente al desarrollo de síntomas alimentarios en ambos géneros, avalan y extienden la evidencia transversal anterior (Bäck, 2011; Boone, 2013) y convergen, además, con estudios longitudinales previos que informaron que un apego inseguro era predictor del aumento de los síntomas alimentarios (Burge et al., 1997; Goossens et al., 2012). Los análisis comparativos de género

mostraron que este efecto protector era más robusto y duradero en las niñas (de 10 a 16 años) que en los niños. Es posible que esta influencia diferencial del apego materno responda, al menos en parte, a las distintas relaciones que suelen establecer y mantener las niñas y los niños con sus madres (Margolese, Markiewicz y Doyle, 2005). Mientras que las niñas conservan una relación cercana, los niños se hacen más autónomos y reducen la búsqueda de apoyo materno con la edad (Delgado-Gallego, Oliva y Sánchez-Queija, 2011).

Con respecto al papel que juega el apego al padre, encontramos que no difería significativamente entre géneros; no obstante, la dirección de su influencia fue diferente. Concretamente, las niñas que informaron de un mejor apego al padre a la edad de 10-11 años también informaron de menos síntomas alimentarios dos años después, en línea con estudios transversales (Boone, 2013; Goossens et al., 2012) y estudios prospectivos previos que apoyan el papel de los padres en la promoción de actitudes y comportamientos alimentarios saludable de sus hijas en la adolescencia temprana (Korotana et al., 2018; Pace et al., 2012). Por el contrario, los niños que informaron de más síntomas alimentarios a los 10-11 años también manifestaron una mejor calidad de apego al padre dos años después. Es plausible suponer que los niños con síntomas alimentarios tiendan a depender de sus padres para hacer frente a sus dificultades. De hecho, durante la primera mitad de la adolescencia, los niños colocan a sus padres en los niveles más altos de sus jerarquías de apego, mientras que las niñas no (Viejo et al., 2018). Para los niños de 10 años, los padres suelen funcionar como referencia o modelo a seguir (Buist, Dekovic, Meeus y van Aken, 2002). A este respecto, los padres cumplirían una de las funciones principales, que es la de ofrecer una 'base segura' (Kerns et al., 2015). Sin embargo, este resultado debe interpretarse con cautela y requiere replicación, dado que el efecto encontrado fue pequeño.

Con respecto al impacto prospectivo de la calidad del apego a los iguales sobre los síntomas alimentarios, no se observaron asociaciones significativas, aunque las niñas declararon mayor apego a sus compañeros que los niños, confirmándose así su tendencia a buscar mayor cercanía emocional en los iguales, como fuente de apoyo

emocional y disfrute diario (Kerns y Brumariu, 2016; Viejo et al., 2018).

Por el contrario, los niños que informaron de una mejor relación de apego con sus compañeros a los 10 años, también manifestaron más síntomas alimentarios dos años después, aunque este efecto fue estadísticamente pequeño. Durante la transición a la adolescencia, cuando los niños tienen la percepción de que su cuerpo no es tan grande y musculado como el de sus compañeros, pueden preocuparse e iniciar conductas poco saludables para alcanzarlo (Ricciardelli, 2012). Existe evidencia previa de que los comentarios de los compañeros, como estrategias para ponerse más musculoso (McCabe y Ricciardelli, 2003; Ricciardelli, 2012) o para perder peso, son predictoras de sintomatología bulímica (Le Grange et al., 2014; Vincent y McCabe, 2000). No cabe duda, de que tanto a las niñas como a los niños les pueden afectar los comentarios de sus iguales, pero parece que en el caso de los niños a estas edades se convierten, además, en desafíos. No obstante, como no se pudo determinar si los amigos elegidos por los niños experimentaron o expresaron patología alimentaria, esta posibilidad es meramente especulativa y debería verificarse en futuros estudios (Le Grange et al., 2014).

Teniendo en cuenta los resultados del estudio 2, en consonancia con la teoría de Bowlby (1969/1982), los niños que internalizaron una representación de disponibilidad y protección de sus padres (apego seguro) suelen adoptar estrategias de afrontamiento efectivas frente a la angustia, como consecuencia declaran menos síntomas depresivos desde los 10 a los 14 años (Kerns et al., 2015; Mikulincer y Shaver 2012; Morley y Morgan 2011). Además, el análisis inverso señaló que los síntomas depresivos deterioran la calidad de apego a ambos padres, en concreto, desde los 12 a los 16 años. Investigaciones previas han documentado cambios sustanciales en los patrones de apego durante la infancia y la adolescencia (Buist et al., 2002). Por una parte, los padres cambian la expresión de su disponibilidad emocional a lo largo de los años, ya que deben equilibrar el respeto por la autonomía del adolescente con la necesidad de continuar protegiéndolo en situaciones de peligro (Kobak, Abbott, Zisk y Bounoua, 2017; Lamb y Lewis 2011; Zeegers et al.2017) y, por otra

parte, el adolescente disminuye gradualmente su dependencia de los padres (Allen & Tan 2016). Según la teoría interpersonal de la depresión (Coyne, 1999), los síntomas depresivos pueden dificultar la comunicación entre padres e hijos y aumentar los conflictos, lo que a su vez hace que los padres dejen de funcionar como fuente de consuelo o ayuda. En conjunto, estos hallazgos respaldan la influencia de la calidad de las relaciones de apego en los síntomas depresivos en la transición a la adolescencia media como dinámica y recíproca (Brumariu y Kerns, 2010; Boutelle et al. 2009).

El examen del impacto diferencial de la calidad de apego a la madre y al padre en el desarrollo de los síntomas depresivos, evidenció que los déficits de comunicación y confianza con la madre tenían un impacto mayor en los síntomas depresivos que con el padre, especialmente de 12 a 14 años de edad. Estos hallazgos están en sintonía con estudios anteriores que señalan que los adolescentes confían más en sus madres como "refugio seguro" en momentos de angustia que en sus padres (Kerns et al., 2015; Markiewicz et al., 2006). El papel más activo de la madre en el cuidado diario de los hijos fomenta una mayor cercanía física y emocional, que le proporciona un mayor conocimiento y agilidad para responder a las demandas y necesidades del niño ante sus emociones negativas. Es posible que los adolescentes que perciben que no pueden comunicarse libremente con sus madres para confiarles sus emociones negativas manifiesten más problemas emocionales y, por lo tanto, corran un mayor riesgo de síntomas depresivos (Duchesne y Ratelle, 2014). Además, también encontramos que los síntomas depresivos tuvieron un efecto erosivo más fuerte sobre el apego a la madre durante la transición a la adolescencia media (de 14 a 16 años). Si se supone que las relaciones con las madres generalmente son más estrechas que con los padres, la búsqueda reiterada de apoyo y sosiego que los "adolescentes deprimidos" demandan de sus madres podría tener un efecto perjudicial en sus relaciones (Joiner y Metalsky, 2001). Por el contrario, los padres suelen percibirse como menos afectivos y disponibles, particularmente en situaciones en las que se busca un refugio seguro (Lamb y Lewis, 2011; Viejo et al., 2018), lo que podría explicar la falta de efecto. No obstante, teniendo en cuenta que

obtuvimos una alta correlación entre el apego materno y paterno, y correlaciones moderadas entre apego al padre y los síntomas depresivos, este resultado requiere más investigación.

Con respecto a los efectos diferenciales del apego a los padres en niños y niñas, se encontró que las niñas parecen estar más afectadas que los niños, particularmente entre los 12 y los 14 años (Lewis et al., 2015; Margolese et al., 2005; Windle, 1992). Esta mayor sensibilidad de las adolescentes puede responder a que, además de afrontar los cambios propios de la pubertad que entrañan riesgo de síntomas depresivos (Patton et al., 2008; Skoog et al., 2016), tienden a enfatizar la comunicación y la confianza en las relaciones que también las hace más vulnerables a la depresión (Nolen-Hoeksema & Hilt, 2009). Por el contrario, esta influencia no fue significativa en el caso de los niños. Como se mencionó anteriormente, los niños tiendan a desarrollar más autonomía y a separarse de sus padres a medida que crecen (Galambos, 2004) y, además, suelen utilizar un estilo de afrontamiento más evasivo frente a las emociones negativas en línea con las expectativas del rol de género (Giudice y Belsky 2010; Polce-Lynch et al. 2001).

A través de dos metanálisis, se evaluó el tamaño del efecto de una amplia gama de factores psicológicos que podrían mediar las asociaciones entre apego inseguro y síntomas alimentarios y depresivos, respectivamente (estudios 3 y 4). En el estudio 3, las estrategias de desregulación emocional, tanto a nivel clínico como subclínico, y los síntomas depresivos a nivel subclínico fueron los mediadores que obtuvieron el mayor tamaño del efecto para explicar cómo el apego inseguro se vincula con los síntomas alimentarios. En general, nuestros hallazgos respaldan la elevada prevalencia del apego inseguro en las muestras clínicas y señalan cómo se puede vehicular, a través de determinados mediadores, su riesgo para el desarrollo de síntomas alimentarios (Kuipers y Bekker, 2012; Ward et al., 2000). Además, de acuerdo con los resultados de este metanálisis, no hubo diferencias significativas en el impacto de estos mediadores en estudios con muestras femeninas y mixtas, ni entre estilos de apego inseguro y subtipos de TCA (Faber et al., 2018; Tasca, 2018). A diferencia de algunos estudios previos (Zachrisson y Skaderung,

2016; Tasca, 2018), la comparación de los tamaños del efecto de los mediadores entre muestras clínicas vs. no clínicas, mostró que éstos eran mayores en las muestras no clínicas. Una explicación plausible para estos resultados es que el efecto directo del apego inseguro sobre los síntomas alimentarios fuese más potente que el efecto indirecto en las muestras clínicas incluidas en este metanálisis. Asimismo, es importante tener en cuenta que la mayoría de los estudios evaluados en este metanálisis se realizaron con muestras no clínicas.

En el estudio 4, los resultados del metaanálisis indicaron que las variables de los dominios cognitivo (autocrítica, la baja autocompasión, las actitudes disfuncionales) y emocional (estrategias hiperactivas de regulación emocional, pensamiento repetitivo, particularmente, rumiación *brooding*) alcanzaron los tamaños del efecto más robustos en la mediación entre apego inseguro y síntomas depresivos. Análisis preliminares arrojaron evidencia meta-analítica de la influencia de los mediadores mencionados independientemente del tipo de muestra (clínica vs. no clínica), del género (masculino vs. femenino) o el tipo de apego inseguro (ansioso vs. evasivo), en el desarrollo de sintomatología depresiva. Sólo surgió diferencia significativa entre los estudios con adultos vs. niños/adolescentes, ya que en estos últimos los efectos no fueron significativos. Este hallazgo podría deberse, al menos en parte, al hecho de que durante la infancia y la adolescencia los efectos directos del apego inseguro en el desarrollo de síntomas depresivos puedan ser más fuertes que los efectos indirectos, ya que el entorno de cuidados es estable y no varía. En la edad adulta, sin embargo, el contexto y las relaciones de apego varían, de modo que las asociaciones directas entre el apego inseguro temprano y la psicopatología posterior podrían perder fuerza y el efecto nocivo del apego inseguro pasaría a canalizarse a través de mediadores que se van consolidando en el tiempo (Bakermans-Kranenburg y van IJzendoorn, 2016; Sroufe, 2016). Este metaanálisis subraya la importancia de los mecanismos relacionados principalmente con las emociones y las cogniciones en la asociación entre el apego inseguro y los síntomas depresivos entre los adultos.

Como era de esperar, los procesos cognitivos negativos basados en patrones de apego inseguro se erigieron como las principales vías

en esta asociación. Según nuestros resultados, la autocrítica, la baja autocompasión y las actitudes disfuncionales no sólo son congruentes con las representaciones mentales negativas de sí mismo y del entorno que se construyen en las relaciones de apego inseguro, sino que además potencian sus efectos nocivos y los canalizan hacia la depresión (Morley y Moran, 2011). Por otro lado, dentro del dominio emocional y en consonancia con la teoría del apego, las personas con apego inseguro tienden a usar estrategias de regulación emocional desadaptativas que, o bien hiperactivan, o desactivan el sistema de apego (Mikulincer & Shaver, 2016). Teniendo en cuenta la literatura previa, las estrategias hiperactivadoras son las principales candidatas a mediar la relación entre apego inseguro y depresión (Malik et al., 2015). Así, las personas con un estilo de apego inseguro (probablemente ansioso) tienden a reaccionar de forma exagerada ante sentimientos negativos y recurren al apoyo, cercanía y atención de los demás (p. ej., Cassidy, 2016; Mikulincer & Shaver, 2016). En el presente trabajo, las estrategias hiperactivadoras (pensamiento repetitivo y rumiación *brooding*) alcanzaron el mayor tamaño del efecto. A tenor de este resultado, es probable que las personas con apego inseguro queden atrapadas en una espiral de pensamientos repetitivos, improductivos y negativos, centrando su atención en el temor al abandono o al fracaso, lo que a su vez fomenta el desarrollo y el mantenimiento de los síntomas depresivos (Beyderman and Young, 2016). En cuanto a las variables pertenecientes al dominio interpersonal, no obtuvimos efectos indirectos significativos. Este resultado podría reorientar el análisis hacia el potencial efecto moderador de estas variables, es decir, averiguar si podrían contribuir al desarrollo de síntomas depresivos interactuando conjuntamente con los procesos desadaptativos cognitivo-emocionales que se fraguan en el apego inseguro (Hammen et al., 1995; Hankin et al., 2005). No obstante, esta idea idea no deja de ser una hipótesis pendiente de verificación en futuras investigaciones longitudinales.

Por último, se puso a prueba un modelo integrador que contempla la interrelación entre el apego inseguro a los padres y la sintomatología depresiva y alimentaria (estudio 5). Los resultados confirmaron que las relaciones de apego inseguro a la madre

contribuyen, en mayor medida que al padre, en el desarrollo de síntomas alimentarios a través del aumento de los síntomas depresivos. Específicamente, el apego inseguro de los 10 a los 12 años predijo síntomas alimentarios cuatro años más tarde mediante el incremento de los síntomas depresivos de 12 a 14 años. Cabe añadir, que no se encontraron diferencias de género en estos efectos. En consecuencia, los síntomas depresivos parecen jugar un papel clave en la transferencia del efecto nocivo de un apego inseguro a la madre en el desarrollo de psicopatología alimentaria en niños y niñas. La asociación entre apego inseguro y síntomas depresivos podría explicarse por el impacto que determinados procesos cognitivo-emocionales enraizados en experiencias tempranas negativas ejercen posteriormente (Brumariu y Kerns, 2010; DeKlyen y Greenberg, 2016), como se identificó en el objetivo 4 de esta tesis. Por otro lado, el segundo eslabón de este modelo demuestra que las conductas alimentarias anómalas pueden surgir como una estrategia de auto-regulación desadaptativa o "vía de escape" ante las emociones negativas (Ferreiro et al., 2014; Haedt-Matt y Keel, 2011). Al no encontrarse diferencias de género, estos hallazgos subrayan la importancia del apego materno como "*refugio seguro*" en el ajuste emocional de niños y niñas desde la infancia media a la adolescencia (Allen & Tan, 2016; Viejo et al., 2018) y, a la vez, destacan que los niños también están expuestos a desarrollar síntomas alimentarios (Sweeting et al., 2015) con el concurso de los síntomas depresivos. En suma, los resultados ponen de relieve que los síntomas depresivos podrían constituir un mecanismo esencial por el cual el apego inseguro a la madre canaliza la vulnerabilidad a desarrollar problemas alimentarios a lo largo de la adolescencia. Por consiguiente, la promoción de relaciones de apego seguras, particularmente con la madre, durante la transición a la adolescencia, junto con otros factores intrapersonales y ambientales, podría proteger a los jóvenes frente al desarrollo de síntomas depresivos y el posterior desarrollo de problemas alimentarios.

6. CONCLUSIONES

- La calidad de la comunicación y la confianza con los padres, particularmente con la madre, protege frente al desarrollo posterior de síntomas alimentarios. Además, los adolescentes varones que informan de más síntomas alimentarios recurren más a la cercanía y la seguridad de las relaciones paternas. A la inversa, los síntomas alimentarios deterioran las relaciones de apego con las madres únicamente en el caso de las niñas (objetivo 1).
- El apego inseguro con ambos progenitores predice síntomas depresivos prospectivamente, incluso después de controlar los factores de confusión invariantes en el tiempo, aunque es mayor el efecto del apego a la madre. La buena percepción de la calidad de apego con la madre es particularmente protectora contra la depresión futura, y esta influencia es más importante en las niñas que en los niños. Además, los síntomas depresivos erosionan significativamente las relaciones de apego con las madres. (objetivo 2).
- Los padres cumplen funciones únicas y primarias relacionadas con el apego en la adolescencia y desempeñan una función significativamente diferente de otras relaciones sociales de apoyo, como las de los iguales. De hecho, es probable que se busque el apoyo emocional de los compañeros en contextos que involucran estresores diarios o desafíos que no son de emergencia, especialmente en las niñas. En general, se ha demostrado que las madres se identifican como la figura principal de apego, que constituye un *refugio seguro*, frente a la psicopatología alimentaria y depresiva, sobre todo en las niñas (objetivos 1 y 2).
- Los síntomas depresivos y la desregulación emocional son las principales variables intermedias que asocian el apego inseguro con la vulnerabilidad a los síntomas alimentarios (objetivo 3).
- El vínculo entre apego inseguro y síntomas depresivos se explica, fundamentalmente, por la mediación de variables de los dominios cognitivo (autocrítica, baja auto-compasión y actitudes

disfuncionales) y emocional (estrategias hiperactivas de regulación emocional, pensamiento repetitivo, particularmente la rumiación *brooding*) (objetivo 4).

- Los síntomas depresivos podrían constituir la vía a través de la cual el apego inseguro a la madre incrementa el riesgo de desarrollar problemas alimentarios tanto en niños como en niñas a lo largo de la adolescencia, incluso controlando los niveles iniciales de síntomas depresivos y alimentarios, la calidad del apego y los factores de confusión invariantes en el tiempo (objetivo 5).
- La promoción de relaciones seguras de apego con los padres durante la transición a la adolescencia en ambos géneros es crucial frente al desarrollo de síntomas alimentarios y depresivos. A nivel de prevención, programas orientados a los padres que les doten de habilidades para mejorar la comunicación y resolver conflictos, y que promuevan la cohesión y la estabilidad podrían ser efectivos para reducir el riesgo de depresión y de trastornos alimentarios. También, pueden ser útiles las intervenciones dirigidas a los déficits del apego que aborden las cogniciones negativas acerca de uno mismo y de los demás, probablemente enraizadas en esquemas mentales tempranos, que fomentan y amplifican un punto de vista negativo de la realidad, dificultades a la hora de regular las emociones y un funcionamiento interpersonal problemático en los niños y niñas. Este tipo de intervenciones podría interrumpir la cadena mediacional por la que el apego inseguro conduce a problemas alimentarios.

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X. APPENDICES

Appendix 1. Published and under review studies in peer-reviewed journals included in the present Doctoral Thesis.

Exploring the reciprocal relationships between adolescents' perceptions of parental and peer attachment and disordered eating: A multiwave cross-lagged panel analysis.

https://onlinelibrary.wiley.com/doi/full/10.1002/eat.23086

Prospective Bidirectional Associations between Attachment and Depressive Symptoms from Middle Childhood to Adolescence.

https://link.springer.com/article/10.1007/s10964-019-01081-4

Mediators linking insecure attachment to eating symptoms: A systematic review and meta-analysis

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0213099

Manuscript Details

Manuscript number	JAD_2020_1384
Title	Mediational mechanisms involved in the relation between attachment insecurity and depression: A meta-analysis
Article type	Review Article

Abstract

Background: Several studies have investigated the mediators through which insecure attachment influence the development of depression. However, there has not been a systematic synthesis of this literature to date. The current meta-analytic review aimed at identifying such mediating processes and quantifying their effect size. Methods: We systematically searched Medline, Pubmed, Psycinfo, Embase, Proceedings Web of Science and ProQuest Dissertations & Theses Global up until May 2019. 108 studies met inclusion criteria. Standardized regression coefficients of the indirect and total paths of mediation models of 80 studies were pooled using the inverse of their variance as a weight. Studies were coded and ranked for quality. Results: Dysfunctional attitudes (β = 0.10, 95% CI = 0.01 to 0.20), self-criticism (β = 0.17, 95% CI = 0.04 to 0.28), low self-compassion (β = 0.16, 95% CI = 0.02 to 0.29), and cognitive hyperactivating regulation strategies (β = 0.13, 95% CI = 0.05 to 0.20), such as repetitive thinking (β = 0.17, 95% CI = 0.07 to 0.28), and particularly, brooding rumination β = 0.20, 95% CI = 0.07 to 0.32), mediated the association between insecure attachment and depressive symptoms. Indirect effects were only significant among adult populations. Limitations: The methodological quality of studies was mostly moderate to low and analyses revealed considerable heterogeneity. Conclusion: Our findings support the direct targeting of cognitive-emotional psychological mechanisms in prevention programs and treatment of depression. More longitudinal studies are needed to clarify the interplay of such mediators along with other interpersonal factors between insecure attachment and depression.

Keywords	depression; attachment Insecurity; mediators; meta-analysis; systematic review
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Suggested reviewers	Kristine Viddal, Therese Skoog, Mahyar Etminan, Lars Wichstrøm

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Research Data Related to this Submission

There are no linked research data sets for this submission. The following reason is given:
Data will be made available on request

Highlights

- This is the first meta-analysis assessing mediators in the association insecure attachment-depression.
- Specific cognitive and emotional processes significantly mediated such association.
- Our findings support the direct targeting of cognitive-emotional psychological mechanisms in prevention programs and treatment of depression.
- Longitudinal studies need to clarify the interplay of such mediators along with interpersonal factors between insecure attachment and depression.

Abstract

Background: Several studies have investigated the mediators through which insecure attachment influence the development of depression. However, there has not been a systematic synthesis of this literature to date. The current meta-analytic review aimed at identifying such mediating processes and quantifying their effect size.

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Limitations: The methodological quality of studies was mostly moderate to low and analyses revealed considerable heterogeneity.

Conclusion: Our findings support the direct targeting of cognitive-emotional psychological mechanisms in prevention programs and treatment of depression. More longitudinal studies are needed to clarify the interplay of such mediators along with other interpersonal factors between insecure attachment and depression.

Keywords: Depression; Attachment Insecurity; Mediators; Meta-analysis

Mediational mechanisms involved in the relation between attachment insecurity and depression: A meta-analysis

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Declarations of interest: None

1. Introduction

Depression is a commonly occurring, seriously impairing, and often recurrent mental disorder that represents a significant and unquestionable global health concern (Kessler, 2012). Currently, it is the leading cause of disability worldwide affecting quality of life, mortality and morbidity (Kessler and Bromet, 2013; Miret et al., 2013), and producing extremely high socioeconomic costs (Greenberg et al., 2015; Kessler, 2012). It is noteworthy that depressive symptoms below the diagnostic threshold may also have a detrimental impact on health and psychosocial functioning (Ayuso-Mateos et al., 2010), even beyond increasing the risk for later depressive disorders (Lewinsohn et al., 2000). Given the personal and societal burden incurred by depression, it is crucial to identify factors responsible for their emergence, maintenance or exarcebation. Such knowledge will help prevention and treatment efforts.

Numerous theorists have suggested that early experiences can—and do— play an *enduring* role in placing an individual at risk for depression (Fraley et al., 2013; Moran et al., 2008). Attachment theory (Bowlby, 1969/1982) offers important insights to enlarge and depeen our understanding of how these early experiences of care and attention shape child's mental representations of self, others and relations across life span (Cassidy, 2016). Such mental representations or working models, based on infant's expectations for the accessibility and responsiveness of their caregiver, work as guidelines of thoughts, feelings, and behaviors in future relationships (Cassidy, 2016). In this regard, children come to develop an insecure attachment when caregivers are inconsistent or unavailable in responding to their needs. This results in maladaptive mental representations that will function as a pessimistic template through which one interprets the world and the future (Roepke and Seligman, 2016).

Several studies have examined links between insecure attachment and depressive symptoms in children (DeKlyen and Greenberg, 2016), adolescents (Allen and Tan, 2016) and adults (Stovall-McClough and Dozier, 2016). However, many scholars have questioned the direct path between these two constructs from infancy to adulthood (Fraley et al., 2013), and instead, they argue that early attachment experiences do influence later depression through different intermediate mechanisms (Hankin et al., 2005; Malik et al., 2015; Morley and Moran, 2011). In an effort to understand the legacy of early insecure attachment experiences in the development of depression, researchers have identified a set of cognitive, emotional and interpersonal mechanisms that are related and complementary as explanatory processes through which such association persists over time (Monti and Rudolph, 2014; Moran et al., 2008).

Maladaptive cognitive processes have been the focus of numerous well-established theories of vulnerability to depression for their consistent implication in the onset, maintenance and remission of depression (Abela and Hankin, 2009). This perspective considers that each child develops such cognitive vulnerability in maladaptive early experiences with caregivers (Beck, 1987), which is a premise entirely consistent with attachment theory. According to Morley and Moran (2011), *negative self representations* rooted in dysfunctional early attachment relationships influence the perception, interpretation and response to future stressful events. Insecurely attached individuals may hold "negative interpretative lens" that give rise to maladaptive person-specific cognitive biases (e.g., tendency to selectively focus on disappointing aspects of a situation; Beck, 1987). Hence, when individuals with a history of insecure attachment undergo adverse life experiences, self-critical attitudes and negative attributions arise,

eventually undermining their self-concept and increasing the vulnerability to depression (Lee and Hankin, 2009; Moran et al., 2008).

Other models of depression suggest that insecure attachment promotes later depression through *dysfunctional emotion regulation strategies* that develop within the parent-child dyad (DeKlyen and Greenberg, 2016; Malik et al., 2015) – not surpringly as dysfunctional emotion regulation plays a major role in the development and course of depressive symptoms (Compas et al., 2009; Mennin et al., 2007). One of the functions of attachment relationships is to assist in regulating children's emotions, especially emotions that are potentially disturbing or overwhelming (Thompson, 2016). In secure attachment relationships, primary attachment figures act as *safe haven* in times of distress, that is, they are sensitive to the child's need for proximity and comfort and provide the necessary assistance to regulate negative emotions, alleviate distress and protect them from physical and emotional threats. However, individuals with insecure attachment following distress and the failure of relieving responses from attachment figures, employ secondary strategies of emotional regulation to restore emotional balance (Mikulincer and Shaver, 2012). For instance, they either hyperactivate their attachment system to maintain proximity with their caregivers and thus avoid potential abandonment (anxious attachment), or deactivate their attachment system and minimize their need to relate for fear of the aversive results that proximity with the attachment figure could generate (avoidant attachment). A coping strategy centered on negative emotions that has acquired great relevance in the study of vulnerability to depression is *rumination*. Rumination represents an ineffective coping response whereby people try to better understand their depressive mood by repeatedly think about its causes, meanings and consequences (Nolen-Hoeksema et al., 2008). Rumination, which can be considered a type of hyperactivating cognitive strategie of emotion regulation (Malik et al., 2015),

encompasses two aspects associated with depression: *brooding* which involves the tendency to dig into the negative consequences of one's depression and *reflection* which involves the tendency to understand the reasons for one's depressed mood and, in turn, engage in cognitive problem-solving to improve their mood (Miranda and Nolen-Hoeksema, 2007). Rumination has been associated with anxious attachment in adults (Mikulincer and Shaver, 2007) and with heightened risk for developing depression (Aldao et al., 2010). Thus, researchers consider that rumination may be a compelling mediational mechanism in the association between insecure attachment and depressive symptomatology.

Lastly, the repeated interactions and experiences with attachment figures provides an interpersonal context through which children organize individuals expectations of others and acquire a general understanding of relationships (Bowlby, 1988; Shaver and Mikulincer, 2014). As a result of early insecure attachment relationships characterized by parent's rejection or insensitivity towards child's needs, individuals may either try to counteract the fear of abandonment and rejection by engaging in close, intense, and demanding relationships to ensure closeness (anxious attachment), or distrust others and systematically reject closeness by maintaining distance in interactions (avoidant attachment) (Mikulincer and Shaver, 2012; Paech et al., 2016). These particular ways of being in relation to others can eventually result in experiencing real or perceived low interpersonal competence (Paech et al., 2016; Wei et al., 2005) or low social support (Keleher et al., 2010; Zhu et al., 2016). Moreover, any disappointment or failure in interpersonal experiences can be interpreted in terms of personal unworthiness and incompetence, which may, in turn, contribute to the development of depressive symptoms (Margolese et al., 2005; Sund and Wichstrøm, 2002).

2. The present meta-analysis

Broad research supports the link attachment-depressive symptoms across life span. However, in most cases the influence of insecure attachment on depression may be indirectly conditioned by the concurrence of different intermediate variables, mainly related to cognitive vulnerabilities, dysfunctional emotional regulation strategies and interpersonal difficulties. Despite the growing number of studies testing mediation models, no research has yet identified and evaluated the effect size of such mediating mechanisms. Consequently, evidence on putative mediators that may explain how insecure attachment predisposes to the development of depressive symptoms is needed. In order to fill this gap, we conducted a comprehensive meta-analysis of prospective and cross-sectional studies examining potential mediators between insecure attachment and depressive symptoms, both at the clinical and sub-clinical level, including participants of any age. Our results will provide new insight to clarify how insecure attachment may increase vulnerability to depressive symptoms. Moreover, a better understanding of the specific mechanisms involved in the development of such a debilitating condition will enable the optimization of clinical interventions and prevention programs.

3. Method

The protocol for the current review was registered with the PROSPERO international prospective register of systematic reviews (ref: CRD42017079626). This review followed the PRISMA reporting guidelines (Moher et al., 2009).

3.1. Search strategy

First, a comprehensive systematic search was performed in the following databases: MEDLINE, Pubmed, PsycINFO and EMBASE from the earliest records until November 2017. These searches were later updated to May 2019. We used the following search strategy in PsycInfo and the same combination of keywords for the

different databases: [ab(attachment) AND ab (depress* OR "depression" OR depressive disorder* OR depressive symptom*) AND ab (mediat* OR indirect OR "structural equation modeling" OR "structural equation modelling" OR "SEM" OR "path" OR (Baron AND Kenny) OR "MacKinnon" OR "product of coefficient" OR "difference in coefficient" OR "sobel" OR "causal pathway" OR "intermediate" OR "indirect effect" OR "mechanism")]. Additionally, Proceedings Web of Science (Conference Proceedings Citation Index- Science (CPCI-S), Social Science & Humanities (CPCI-SSH)) and ProQuest Dissertations & Theses Global were also searched to identify relevant studies. Reference lists of included studies and systematic reviews were scanned for any additional relevant studies.

3.2. Inclusion/exclusion criteria

The following inclusion criteria were adhered to in all studies: (1) only empirical studies reporting on the effect of mediating mechanisms linking attachment style (towards father, mother and peers or romantic partner) and depressive symptoms; (2) studies that had formally conducted a mediation analysis (e.g. Baron and Kenny's causal steps of mediation, structural equation modelling) or significance tests of mediation (e.g. Sobel test, bootstrapping); (3) studies carried out with participants at any age from clinical (by criteria DSM-IV, DSM-IV-TR, or DSM-5) and subclinical samples (individuals exceeding the clinical cut-off of depression measures or reporting depressive symptoms that place them at risk); and (4) only articles written in English, Spanish, German or French.

Patients with other significant physical diseases or mental disorders were excluded. We did not consider papers exploring attachment as a mediator since the focus of our study is to understand attachment as an independent variable. We also excluded other reviews and meta-analyses.

3.3. Study selection

Preliminary screening of the studies obtained by the systematic search in relation to the inclusion and exclusion criteria was performed by the main author (LCG). Three co-authors (LCG, RRC, CS) reviewed all titles and abstracts, excluded studies that did not address mediational analysis, and independently examined each full article to determine final inclusion or exclusion. Reasons for exclusion of full texts were recorded and documented in a PRISMA flow diagram (Fig. 1). Discordances on inclusion or exclusion of articles were analyzed, and disagreements were resolved via discussion. A data extraction template including all eligible studies with key items based on a year of publication, country, recruited population, sample size, methods to assess attachment, mediating variables and depressive symptomatology and main results was designed.

3.4. Data extraction

Data were extracted by two reviewers independently (LCG, CS) using a form that was specifically developed for the current review. These data were further verified independently by a third reviewer (RRC). Extraction data included author, year and country of publication, research aims, setting and design, sample characteristics (i.e. sample size, age range and gender of participants and type of sample), measures used for the independent, mediating and dependent variables, specific mediator(s) under investigation, method of mediation analysis and standardized regression coefficients for the different paths (direct, indirect and total effects). In case of any disagreements between the reviewers regarding the extracted data, they were resolved by consensus, by reviewing again the study or by contacting directly the original author. If necessary, an email request was also sent to the corresponding authors in order to obtain any unpublished data necessary to perform the meta-analysis.

3.5. Data synthesis analysis

All analyses were conducted using the software Comprehensive Meta-Analysis (CMA; Borenstein et al., 2014). We first calculated the pooled overall effect size of the mediators including all studies together, using the inverse of their variance as a weight, and second, we compared if the effect sizes differed according to the sample type, attachment type, age, gender and quality. Moreover, we categorized the data by mediators before pooling. For each analysis, we used standardized regression coefficients (β) and sample sizes to calculate a pooled effect size for the indirect (a*b) and total effects (path c) (Hayes, 2013; Hayes and Rockwood, 2017). When only studies reported the unstandardized regression coefficient (B), we either calculated the β by using unstandardized variables and then multiply them by the ratio between the standard deviation of the respective independent variable and the standard deviation of the dependent variable (β = B*[Sx/Sy]) (Bring, 1994) or used the Pearson correlation coefficient (r) (Peterson and Brown, 2005)]. To inform about the effect size of the mediation effect, we calculated the ratio of the pooled indirect effect and the pooled total effect (Preacher and Kelley, 2011) [P_M = (a*b/c)]. Heterogeneity was assessed using the I^2 statistic and we assigned thresholds of 25%, 50%, and 75% to signify low, moderate, and high heterogeneity, respectively (Higgins et al., 2003). Meta-analyses were performed using a random-effects model.

Publication bias was assessed using Egger's test (Egger et al., 1997). Sensitivity analyses recalculating the pooled estimates under extreme conditions were also performed.

3.6. Quality rating

Eligible papers were evaluated for methodological quality with the critical appraisal tool originally developed by Lee et al. (2015), but further adapted by Cortés-García et al. (2019) for the purpose of the present study (Supplementary Table 1). Each

study was independently rated by 2 reviewers providing a score of 1 (yes) or 0 (no) to the 9 items. Studies were categorized into weak (scoring 0-3), moderate (scoring 4-6), and strong (scoring 7-9) on the basis of these criteria. The quality of studies was assessed with regard to the following elements: aims clearly described, study's design appropriate to aims, representativeness of the sample, psychometric characteristics reported, statistically acceptable methods of data analysis, control of temporal precedence of the variables, main findings clearly described and control of confounding factors. Disagreements between reviewers were resolved by consensus. Furthermore, we carried out a pooled analysis comparing low quality studies (scores < =5) with moderate-high quality studies (scores > 5).

4. Results

4.1. Study characteristics

A flow diagram of the screening process from identification through to inclusion is presented in Figure 1. Initially, a total of 1237 records were selected as eligible to be screened further, of which 213 remained after abstract screening. Among them, 105 did not meet the inclusion criteria and were excluded. Finally, 108 studies met our inclusion criteria and were included for review (88 studies from peer-review journals, 1 conference proceeding and 19 doctoral dissertations), and out of them, 80 were eligible for the meta-analysis (66 studies from peer-review journals and 14 doctoral dissertations). Up to three email requests were sent to the authors of 18 studies in order to obtain the necessary data to perform the meta-analysis. Study characteristics are summarised in Table 1. A total of 93 cross-sectional studies and 15 longitudinal studies provided data on mediational mechanisms. Included studies were conducted in 19 different countries, most commonly in the US and in the UK. All but 4 studies included participants recruited from the community. Sample sizes ranged from 53 to 5065

participants and the mean age of participants across studies ranged from 3.7 to 72.08 years (mostly, adolescent university students and young adults). The majority of studies included both genders, except 18 studies that involved exclusively females and 2 other studies that included only males.

Attachment was assessed using a broad variety of self-report measures, but the most commonly used were: the Experiences in Close Relationships (ECR; Brennan et al., 1998) (including original version, revised versions, short version or version adapted to children), the Inventory of Parent and Peer Attachment (IPPA; Armsden and Greenberg, 1987); the Adult Attachment Scale (AAS; Collins and Read, 1990); the Relationships Questionnaire (RQ; Bartholomew and Horowitz, 1991); and the Relationship Scales Questionnaire (RSQ; Griffin and Bartholomew, 1994).

The main mediators explored in the reviewed literature were divided into three categories related to the cognitive (i.e., dysfunctional attitudes, low self-esteem, maladaptive perfectionism, self-criticism, self-compassion, low sense of coherence, dependence, self-disclosure), emotional (i.e., emotional dysregulation, alexithimia and coping strategies) and interpersonal domain (i.e., perceived social support, relational satisfaction, social comparison, social self-efficacy, interpersonal stressors). Other studies reported mediational effects of different variables (see Supplementary Table 2); however, results regarding these variables were inconclusive due to the reduced number of studies (less than two studies per variable) and therefore were not included in the meta-analysis.

The methodological quality of the 108 retrieved studies ranked from 2 (weak) to 9 (strong) (see Table 2 for individual study quality ratings). The pooled estimate for the indirect effect of mediating variables was 40%, for low quality studies, and 35% for

moderate-high quality studies. In consequence, no significant differences in our results were found regarding quality.

4.2. Meta-analysis

The pooled correlation coefficients for path *a*, path *b*, total effect and indirect effect, with their CIs, the I^2 statistic and effect sizes of each mediation model (*mediation ratio*) are presented in Table 3. Please, see Supplementary Table 3 with detailed extracted and coded data included in the meta-analysis.

4.2.1. Primary analyses

Overall, 38% of the total effect of insecure attachment on depressive symptoms was explained by the indirect effect of the main mediating variables. Heterogeneity was substantial overall and similarly high after stratification by sample, type of attachment, age, quality or gender. No individual study seemed to represent an influential point that increased heterogeneity dramatically. We, therefore, focused on the random effects analyses as recommended by experts.

Comparing sample types, in clinical samples the percentage of the total effect explained by the indirect effect was larger (81%) than in non-clinical samples (31%). Regarding attachment style, the percentage of the total effect explained by the indirect effect was 30% with anxious attachment and 36% with avoidant attachment. The effect size of the mediating variables was not significant among children/adolescents, but was significant among adults and the percentage of the total effect explained by the indirect effect was 35%. Additionally, the effect size of the mediating variables was not significant when differing by gender.

4.2.2. Subgroup analysis by mediators

4.2.2.1. Cognitive domain

Dysfunctional attitudes

A total of five empirical studies (Hankin et al., 2005; Reinecke and Rogers, 2001; Roberts et al., 1996; Safford et al., 2004; Williams and Risking, 2004) and two doctoral dissertations (Martin, 2001; Smagur, 2018) examined the mediational effect of dysfunctional attitudes among adults. Based on this evidence, the pooled estimate of the indirect effect of dysfunctional attitudes was significant. The percentage of the total effect explained by the indirect effect was 40%; heterogeneity was moderate for the indirect effect (I^2 = 53%) and high for the total effect (I^2 = 97%). Three empirical studies (Kamkar et al., 2012; Lee and Hankin, 2009; Margolese et al., 2005) and one doctoral dissertation (Chaowiang, 2008) assessed dysfunctional attitudes as a mediator among children and adolescents. The estimated indirect effect of dysfunctional attitudes was not significant. Heterogeneity was moderate for the indirect effect (I^2 = 60%) and high for the total effect (I^2 = 94%).

Low self-esteem

Seven empirical studies (Hankin et al., 2005; Kang, Lee et al., 2014; Kenny and Sirin, 2006; Lee and Koo, 2015; Love and Murdock, 2012; Roberts et al., 1996; Wei and Ku, 2007) and one doctoral dissertation (Boo, 2010) assessed the indirect effect of low self-esteem with adults. The pooled estimate of its indirect effect was not significant. Heterogeneity was high for both the indirect effect (I^2 = 96%) and the total effect (I^2 = 97%). Among children/adolescents, the pooled estimate of the indirect effect was not significant based on the results of six empirical studies (Bosacki et al., 2007; Kamkar et al., 2012; Kenny et al., 1993; Lecompte et al., 2014; Lee and Hankin, 2009; Suzuki and Tomoda, 2015) and two doctoral dissertations (Graham, 2018; Kenney, 2006). Heterogeneity was high for both the indirect effect (I^2 = 94%) and the total effect (I^2 = 98%).

Maladaptive perfectionism

Based on the results of four studies with adults that measured the indirect effect of this mediator (Gnilka et al., 2013; Reis and Grenyer, 2002; Wei et al., 2004; Wei et al., 2006), we found that its indirect effect was not significant; heterogeneity was moderate for both the indirect effect (I^2 = 55%) and high for the total effect (I^2 = 66%). There were no studies with children/adolescents.

Self-criticism

The pooled estimate of the indirect effect of self-criticism was significant based on the results of three empirical studies (Cantazaro and Wei, 2010; Dagnino et al., 2017; Permuy et al., 2010) and one doctoral dissertation (Rosen Marsh, 2013) with adults. The percentage of the total effect explained by the indirect effect was 57%; there was no heterogeneity. No study evaluated this model in children/adolescents.

Self-compassion

The indirect effect of this variable, taking into account the results of two empirical studies (Joeng et al., 2017; Valikhani et al., 2018) and one doctoral dissertation (Rosen Marsch, 2013) with adults, was significant. The percentage of the total effect explained by the indirect effect was 41%; there was no heterogeneity. Among children/adolescents, the pooled estimate of the indirect effect was not significant (Graham, 2018).

Low sense of coherence

The pooled estimate of the indirect effect of low sense of coherence was not significant with adults (Han and Lee, 2011; Ying et al., 2007); heterogeneity was moderate for the total effect (I^2 = 45%) and inexistent for the indirect effect. There were no studies with children/adolescents.

Dependence

The pooled estimate for the indirect effect of dependence based on the results of six studies (Altin and Terzi, 2010; Besser and Priel, 2008; Cantazaro and Wei, 2010; Dagnino et al., 2017; Permuy et al., 2010; Wei et al., 2005) and one doctoral dissertation (Koroly, 2017) with adults yielded not significant effects. Heterogeneity was high for both the indirect effect (I^2 = 80%) and the total effect (I^2 = 90%). Based on the results of two studies among children/adolescents (Irons and Gilbert, 2005; Puissant et al., 2011), the pooled estimate of the indirect effect was not significant. Heterogeneity was low for the indirect effect (I^2 = 31%) and high for the the total effect (I^2 = 97%).

Self-disclosure

Only two studies with adults assessed the indirect effect of self-diclosure (Cruddas et al., 2012; Wei et al., 2005) and the pooled estimate of the indirect effect was not significant. Heterogeneity was high for the indirect effect (I^2 = 93%) and for the the total effect (I^2 = 93%). No studies tested this model with children/adolescents.

4.2.2.2. Emotional domain

Emotional dysregulation

The indirect effect of emotional dysregulation was not significant in adults (Clout and Brown, 2016; Marganska et al., 2013; Owens et al., 2018; Pickard et al., 2016). Heterogeneity was low for the indirect effect (I^2 = 14%) and high for the total effect (I^2 = 76%). Among children/adolescents (Brenning et al., 2012; Chen et al., 2019), the pooled estimate of the indirect effect was not significant. Heterogeneity was high for both the indirect effect (I^2 = 94%) and the total effect (I^2 = 99%).

Alexithimia

Based on the results of three studies with adults assessing alexithymia as a mediator (Monti and Rudolph, 2014; Owens et al., 2018; Şenkal and Işıklı, 2015), the pooled estimate of its indirect effect was not significant. Heterogeneity was high for the

total effect (I^2 = 89%) and none for the the indirect effect. No studies tested this model with children/adolescents.

Coping strategies

The pooled estimate for the indirect effect of behavioral hyperactivating strategies measured in two empirical studies was not significant in studies with adults (Cooley et al., 2010; Wei et al., 2003). Heterogeneity was high for the total effect (I^2 = 97%) and absent for the total effect. Among children/adolescents, two empirical studies (Gaylord-Harden et al., 2009; Kullik and Petermann, 2013) and one doctoral dissertation (Merlo, 2005) tested behavioral hyperactivating strategies as mediator but the pooled estimate of the indirect effect was not significant. Heterogeneity was low for the indirect effect (I^2 = 23%) and high for the total effect (I^2 = 98%).

Nine empirical studies with adults (Beyderman and Young, 2016; Burnette et al., 2009; Gülüm and Dağ, 2014; Lopez et al., 2001; Mohammadkhani et al., 2017; Vahedi et al., 2016; Valikhani et al., 2018; Wei et al., 2003, 2006) and two doctoral dissertations (Land, 2012; Rosen Marsh, 2013) measured cognitive hyperactivating strategies and its indirect effect was significant. The percentage of the total effect that was explained by the indirect effect was 33%; heterogeneity was low for the indirect effect (I^2 = 36%) and high for the total effect (I^2 = 90%). In contrast, gathering the results of six empirical studies among children/adolescents (Chen et al., 2019; Kullik and Petermann, 2013; Li et al., 2015; Margolese et al., 2005; Ruijten et al., 2011; Van de Walle et al., 2016) and one doctoral dissertation (Lindsay, 2007), the pooled estimate of indirect effect was not significant. Heterogeneity was low-moderate for the indirect effect (I^2 = 26%) and high for the total effect (I^2 = 97%).

The indirect effect of deactivating strategies was not significant based on the evidence of two empirical studies with adults (Lopez et al., 2001; Wei et al., 2003).

There was no heterogeneity. Among children/adolescents, only one study tested this model (Gaylord-Harden et al., 2009) and the pooled estimate of the indirect effect was not significant.

Repetitive thinking

Build on the evidence yielded by four empirical studies (Beyderman and Young, 2016; Burnette et al., 2009; Gulum and Dag, 2014; Mohammadkhani et al., 2017) and two doctoral dissertations (Land, 2012; Rosen Marsh, 2013) with adults, the indirect effect of repetitive thinking was significant in studies with adults. The percentage of the total effect that was explained by the indirect effect was 45%; heterogeneity was high-moderate for the total effect (I^2 = 72%) and none for the indirect effect. Among children/adolescents (Lindsay, 2007; Margolese et al., 2005; Ruijten et al., 2011; Van de Walle et al., 2016), the pooled estimate of the indirect effect was not significant. Heterogeneity was high for the total effect (I^2 = 88%) and absent for the indirect effect.

Rumination

Only two studies with children/adolescents assessed rumination as a mediator (Margolese et al., 2005; Ruijten et al., 2011) and its indirect effect estimated was not significant. Heterogeneity was low for the total effect (I^2 = 2%) and absent for the indirect effect. No studies tested this model with adults.

Brooding rumination

The pooled estimate for the indirect effect of brooding rumination was significant in studies with adults (Beyderman and Young, 2016; Land, 2012; Mohammadkhani et al., 2017; Rosen Marsh, 2013). The percentage of the total effect that was explained by the indirect effect was 53%; there was no heterogeneity. Among children/adolescents, the pooled estimate of the indirect effect was not significant. Only one doctoral dissertation tested this model in children/adolescents (Lindsay, 2007).

Reflection rumination

The indirect effect calculated for reflection rumination was not significant in either adults (Burnette et al., 2009) or children/adolescents (Lindsay, 2007). In total, no significant indirect effect was found. Heterogeneity was high for the indirect effect (I^2 = 71%) and for the total effect (I^2 = 98%).

Self-control

The pooled estimate for the indirect effect of self-control was not significant neither among adults (Valikhani et al., 2018) or children/adolescents (Li et al., 2015). In total, no significant indirect effect was found. Heterogeneity was moderate for the total effect (I^2 = 45%) and absent for the indirect effect.

4.2.2.3. Interpersonal domain

Perceived social support

The pooled estimate for the indirect effect of perceived social support was not significant in studies with adults (Keleher et al., 2010; Kuan Mak et al., 2010; You et al., 2015; Zhu et al., 2016). Heterogeneity was low-moderate for the total effect (I^2 = 47%) and none for the indirect effect. Two doctoral dissertations (Silverman, 2003; Webster, 2000) and one empirical study (Liu, 2006) tested this model among children/adolescents; the pooled estimate of the indirect effect was not significant. Heterogeneity was high for both the indirect effect (I^2 = 94%) and the total effect (I^2 = 98%).

Relational satisfaction

Based on the results of six studies with adults (Altin and Terzi, 2010; Clout and Brown, 2016; Kuan Mak et al., 2010; Paech et al., 2016; Shaver et al., 2005; Wijngaards-de Meij et al., 2007), the indirect effect of relational satisfaction was not

significant. Heterogeneity was high for the total effect (I^2 = 89%) and absent for the the indirect effect. No studies tested this model with children/adolescents.

Relational conflict

The pooled estimate for the indirect effect of relational conflict was not significant in studies with adults (Eberhart and Hammen, 2010; You et al., 2015). There was no heterogeneity. No studies tested this model with children/adolescents.

Social comparison

Two studies with children/adolescents assessed social comparison as a mediator (Irons and Gilbert, 2005; Puissant et al., 2011) and they found that its indirect effect was not significant. There was no heterogeneity. No studies tested this model with adults.

Social self-efficacy

A total of three empirical studies (Paech et al., 2016; Wei and Ku, 2007; Wei et al., 2005) and one doctoral dissertation (Leal, 2018) with adults tested social self-efficacy as a mediator; the pooled estimate of its indirect effect was not significant. There was no heterogeneity. No studies tested this model with children/adolescents.

Interpersonal stressors

The pooled estimate for the indirect effect of interpersonal stressors was not significant neither in adults (Hankin et al., 2005) or children/adolescents (Cohen et al., 2013). In total, no significant indirect effect was found. Heterogeneity was moderate for the total effect (I^2 = 43%) and absent for the indirect effect.

4.3. Publication bias

For the total effect (path *c*), the Egger's test yielded a *P* value of 0.00001. Further, the Trim and Fill analysis using random effects model suggested that 15 studies might be missing. Before the imputation of these potential studies, the pooled *r* was 0.16 (95%CI: 0.01-0.21). After the imputation of the 15 suggested studies, the pooled *r*

was 0.11 (95%CI: 0.06-0.16). For the indirect effect (path *a*b*), there was sign of publication bias since the Egger's test yielded a *P* value of 0.0002. The Trim and Fill procedure suggested that 20 studies were missing. Before the imputation of these studies, the pooled *r* was 0.06 (95%CI: 0.04-0.08). After the imputation of the 20 studies, the pooled *r* was 0.03 (95%CI: 0.01-0.05). Although our analyses suggested that there might be publication bias and the Trim and Fill analysis suggested to include a high number of studies, the estimates after imputation are still robust and significant.

To further evaluate the possibility that our results could be due to publication bias, we recalculated our pooled estimates under the following extreme assumptions: (1) published studies are only half of the studies identifying mediating variables between insecure attachment and depressive symptoms, (2) all unpublished studies found an *r* of 0, and (3) the unpublished studies have a sample size that is the same as the sample average of the published studies. Under these extreme assumptions, the pooled *r* for path *c* was still significant [0.08 (95%CI: 0.05-0.10)]. Similarly, the pooled *r* for path *a*b* showed significance [0.02 (95%CI: 0.01-0.03)]. As such, these analyses indicate that it is unlikely that the observed effects could have been undermined by publication bias.

5. Discussion

The present study provides the first meta-analytic estimates of the indirect effect of a wide variety of mediators that could explain the link attachment–depression in individuals of the general population and patients with depression including all developmental stages (infancy to adulthood). We analyzed a total of 80 studies (66 articles and 14 doctoral dissertations) which included data from 41500 participants. As outcome, 22 different mediators belonging to cognitive, emotional and interpersonal domains were assessed. Our results support an enduring effects model that involves

different cognitive-emotional mechanisms as pathways that contribute in the association between insecure attachment and the development of depressive symptoms across time, which is in agreement with previous reviews (Malik et al., 2015; Morley and Moran, 2011). Contrary to our expectation, the meta-analytic evidence of indirect effects of certain variables pertaining to the interpersonal domain was not significant.

According to primary analyses, the influence of the different cognitive-emotional-interpersonal mediators prevails regardless of type of sample (clinical or non-clinical), gender (male or female) or insecure attachment style (anxious or avoidant). Differences were only found between studies with adults and with children/adolescents; concretely, the indirect effects of insecure attachment through these mediators were not significant in the latter group. Such findings might be explained, at least in part, by the following reasons. First, the relative limited number of studies with children or adolescents could contribute to this divergence, as the majority of studies used non-clinical adult samples. Moreover, it might be possible that the underlying mechanisms through which insecure attachment exerts its influence on childhood and adult depression might differ (Harrington et al., 1996). Nevertheless, this hypothesis needs to be confirmed by further longitudinal research with young populations to ascertain whether such a difference is indeed related to the developmental phase. Second, it is plausible that in childhood and adolescence, as the caregiving environment is relatively stable, the direct impact of early attachment experiences in predicting the development of depressive symptoms is more evident than at a later developmental stage (Groh et al., 2014; Groh et al., 2012). During adulthood, however, as individuals develop and new attachment relationships are established, it would appear that such direct path diminishes over time (Lamb et al., 1984; Lewis, 1998). In this regard, and according with prior research (Fraley et al., 2013), our findings support that the effects of early

attachment experiences on depressive symptoms might be sustained over time through relative consolidated mediators.

5.1. Cognitive domain

In line with the theoretical assertions of Bowlby (1969/1982) and Beck (1979), early insecure experiences have a strong influence on the development of different negative cognitive processes that make individuals more vulnerable to depression later in life (Morley and Moran, 2011). As expected, our results showed that insecure attachment in part increases the risk for depression by cognitive processes, particularly, via dysfunctional attitudes, self-criticism and low self-compassion.

In this meta-analysis, our results showed that *dysfunctional attitudes* could explain the association between insecure attachment and depression. In line with attachment theory, dysfunctional attitudes can be considered as cognitive products that result from negative mental representations or working models (Hazan and Shaver, 1994; Morley and Moran, 2011) and as predictors of depression in adults (Abramson et al., 2002; Scher et al., 2005). Thus, adults who experienced early insecure parent-child attachment relationships hold these relatively enduring, underlying attitudes and assumptions of themselves and the world (i.e., dysfunctional attitudes) which, in turn, predispose them to increases in depression (Cummings and Cicchetti, 1990; Gotlib and Hammen, 1992).

In addition, *self-criticism* proved to be the mediator with the highest effect size. Self-criticism refers to a harsh self-evaluation accompanied by an intense fear of being disapproved or criticized by significant others (Blatt and Homann, 1992). From an attachment perspective, when individuals experience inconsistent early caregiving, they are more likely to fear rejection by others and hold a negative view of themselves (Lyons-Ruth and Jacobvitz, 2016). Such negative feelings elicit self-criticism which

initially may serve to help correct their misbehaviour and keep a good standing with others (Blatt and Homann, 1992; Zuroff and Fitzpatrick, 1995). Yet, self-critical individuals holding negative working models may systematically interprete failures as evidence of their unworthiness which will increase the appearance of depressive symptoms (Blatt, 2004).

Lastly, our results indicated that low levels of *self-compassion* had one of the highest indirect effect sizes linking insecure attachment to depression. Self-compassion is a healthy and kind attitude towards oneself in times of struggle (Neff, 2003) and it appears to operate as an effective self-regulatory strategy for dealing with negative emotions (Vettese et al., 2011). In fact, self-compassion, which can be understood as the inverse of self-criticism (Neff, 2003), has been consistently associated with less depression (Krieger et al., 2013) and may help insecurely attached individuals to experience less emotional distress (Mackintosh et al., 2018). Notably, the ability to self-soothe after stressful or threatening events, which is closely related to self-compassion, develops when the child is comforted by his caregivers in early relationships (Mikulincer and Shaver, 2016). Self-compassion helps to buffer people against the negative cognitive implications of their mistakes (Körner et al., 2015; Terry and Leary, 2011). In this vein, previous studies have shown that high levels of self-compassion mediate between attachment and intrapersonal well being (Raque-Bogdan et al., 2011). Consequently, lacking self-compassion would contribute to increased self-criticism and negative self-feelings among insecurely attached people after personal failures or inadequacies, and eventually, result in more depression.

5.2. Emotional domain

Insecurely attached people struggle facing negative emotions as result of real or perceived lack of effective coping strategies (which can be very much entwined with

maladaptive cognitive factors) and, in turn, are more likely to become depressed. Such maladaptive strategies to regulate emotions either hyperactivate or deactivate the attachment system (Mikulincer and Shaver, 2016). In this regard, our results support hyperactivating emotion regulation strategies as significant mediators in the link insecure attachment-depression. Particularly, individuals with anxious attachment are hypothesized to use hyperactivating strategies which include the use of worry and rumination and a tendency to overreact to their negative feelings, thus gaining support and attention from others (Cassidy, 2016; Mikulincer and Shaver, 2016). Although perhaps these strategies may be initially seen as adaptive for these individuals—particularly, within parent-child relationships in which they were shaped—, they often fail to regulate emotions and can amplify distress (Aldao et al., 2010; Malik et al., 2015). As such, individuals with an ineffective coping system as a consequence of having insecure attachment are more vulnerable to developing depression.

The present meta-analysis evidenced the significant mediational effect of *cognitive hyperactivating coping strategies* between attachment and depression, including repetitive thinking and, more precisely, brooding rumination as specific mechanisms. These results are in line with the research of Malik et al. (2015) who asserts that emotion dysregulation broadly explains the attachment-depression link, but detail it by identifying specific emotional mediational mechanisms that govern such association. Within this domain, *repetitive thinking,* which consists of a perseverative, constant, and relatively uncontrolled cognitive activity centered on negative features of the self and relationships (Watkins, 2008), and more specifically, *brooding rumination*, have been identified as potential mediators explaining the link attachment-depression in both clinical (Beyderman and Young, 2016) and subclinical samples (Margolese et al., 2005; Ruijten et al., 2011). By contrast, the reflection component of rumination was not

identified as a significant mediator. This is not surprising, as prior findings have shown that *brooding* clearly represents the most maladaptive component of rumination and predicts the development of depressive symptoms (Burwell and Shirk, 2007; Olson and Kwon, 2008; Senra et al., 2018); however, the role of the *reflection* in depressive symptoms has not been clarified yet (Burwell and Shirk, 2007). The present study supports, therefore, the idea that insecurely attached people are likely to get trapped in a spiral of repetitive and negative thoughts (i.e., brooding), focusing their attention on fear of abandonment or failure which in turn fosters the development and maintenance of depressive symptoms.

5.3. Interpersonal domain

Despite the hypothetical mediating role that interpersonal processes could have, according to the assumptions of attachment theory (Hankin et al., 2005; Williams and Risking, 2004), the present study did not find significant estimates of their indirect effects.

The lack of significance of the variables pertaining to this domain might be partly explained by the reduced number of studies exploring such variables compared with the broad research testing cognitive-emotional mediators. Also, it is plausible that these variables may function as *moderators*, that is, they could indeed contribute to the development of depressive symptoms but interacting with negative attachment cognitions and emotional dysregulation that arise from insecure attachment relationships (Hammen et al., 1995; Hankin et al., 2005). For instance, negative cognitions and dysfunctional attitudes have been broadly associated with interpersonal problems such as perceptions of poorer social skills and less satisfaction in social relationships (Compas et al., 2009; Rudolph, 2009), and self-reports of negative social interactions (Hammen, 2009; Lakey et al., 1994). Also, self-critical individuals

emphasize achievement at the expense of interpersonal relationships, which may lead to interpersonal stress and lack of social support (Priel and Shahar, 2000) and, by the same token, less self-compasionate people have less motivation to resolve interpersonal mistakes, and in turn, experience more relationship problems (Baker and McNulty, 2011). Similarly, brooding rumination as a maladaptive emotion strategy has been associated with deficits in interpersonal functioning, such as excessive dependency on others (Gorski and Young, 2002) and impaired social problem-solving (Watkins and Moulds, 2005).

Consequently, it is possible that individuals who are vulnerable to depression because of the negative cognitive-emotion processes rooted in insecure attachment relationships are likely to perceive themselves as less socially competent and to experience more interpersonal stressors and hence, are at increased risk to develop depressive symptoms (Hammen, 2009; Hankin et al., 2005). Longitudinal research is, however, needed to further elucidate these developmental pathways to depression as mediational or moderational in nature.

6. Strenghts and Limitations

The present meta-analytic review has gathered evidence of the existing literature concerning mediating variables in the link attachment-depression, including peer-review journals, conference proceedings and doctoral dissertations, which may reduce publication bias. Moreover, to our knowledge, this is the first meta-analysis assessing the indirect effect of a wide range of cognitive, emotional and interpersonal processes that underlie the associations between insecure attachment to different attachment figures and depression in both clinical and sub-clinical samples at any age. This knowledge represents a novelty in attachment research and allows the design of better assessments and interventions.

Despite these assets, the current study should be interpreted in the context of some limitations. First, the majority of the findings proved in this meta-analysis was provided by studies with non-clinical population and Caucasian adults, thus reducing the possibility for extrapolating the results across countries and cultures. Second, our findings were based on data from mostly cross-sectional studies (with exception of 13 empirical studies and 2 doctoral dissertations) which did not make it possible to draw definitive conclusions regarding the direction of the effects between insecure attachment-depression. Third, the heterogeneity of effects between studies was high. Nevertheless, as it is claimed by many authorities in the field, we consider that heterogeneity should be understood as a characteristic rather than a nuisance of a particular meta-analysis (Berlin, 1995). Heterogeneity describes the meta-analysis at hand and its exploration may shed light on other interesting features. In our work, we explored it further by stratifying the analysis into smaller and, theoretically, more homogenous groups (e.g., sample type, attachment style, mediators) and decided to interpret our results taking random-effects estimates as it might be the most appropriate way to deal with this issue (Higgins, 2008). Fourth, the mediation ratio (Ditlevsen et al., 2005) used as a summary of the effect size for each mediator, although it is the most widely used measure, is not exempt from various limitations (Hayes, 2013; Preacher and Kelley, 2011). However, we followed recommendations of its application as the data included in the present meta-analysis reported larger total effects than indirect effects of the same sign, and were based on large samples. Finally, the psychometric measures used in most of the studies were predominantly self-report measures. Therefore, some results may be subject to retrospective bias.

7. Implications for research

Further longitudinal studies should explore mediating mechanisms implementing designs with a temporal sequence ascertaining the precedence of the variables, for instance, by applying powerful statistical techniques such as Structural Equation Modeling with bootstrapping (Hayes and Rockwood, 2017). Because of the possible association between the cognitive-emotional-interpersonal factors, it would be interesting to explore the interplay among them through sequential multiple mediation models. Additionally, more studies should test mediational models with clinically depressed patients and with adolescents' samples, due to the paucity of studies with these populations. Also, future research should apply other observational measures of attachment as the majority of studies were based on self-report measures. In this regard, as recommeneded by attachment researchers, the Adult Attachment Interview (AAI) is acknowledged as the gold standard measure for adult samples (Main et al., 1985), and the Child Attachment Interview (CAI; Shmueli-Goetz et al., 2008) has shown the best psychometric properties for children and adolescent populations (Jewell et al., 2019). Lastly, the control for confounding variables to rule out possible spurious effects merits particular attention. Importantly, the application of Dynamic Panel Model (DPM) is highly rcommended as it is a novel analytical approach that takes into account time-invariant confounding factors (Bollen and Brand, 2010; Wichstrøm et al., 2017), rendering estimates of prediction free of contamination from a range of potential confounders such as genes, common methods effects, and stable personality and parenting practices.

8. Clinical Implications

The negative influence of insecure attachment on depressive psychopathology into adulthood has been widely demonstrated (Dagan et al., 2018; Stovall-McClough and Dozier, 2016), but the present results expand it by indicating the specific cognitive-

emotional variables that may operate as intermediate mechanisms. This evidence may guide clinicians to address those cognitive-emotional processes that maintain and aggravate depressive symptoms or pose a risk for their possible development. Altering the mediational chain by which insecure attachment leads to depression may guarantee better therapeutic outcomes (Malik et al., 2015; Morley and Moran, 2011). For instance, intervening at the level of self-representations by improving self-esteem and promoting more self-compassion, and to provide skills to better manage negative emotions and interpersonal problems may decrease distress and subsequent symptoms of depression. Additionally, the combination of a cognitive-behavioral treatment with mindfulness techniques (reducing self-judging and rigid thoughts rooted in negative working models and increasing self-compassion and acceptance) could be a new path of treatment that could offer promising results (MacKenzie et al., 2018), as it has been already tested in patients with major depressive disorder (Ma and Teasdale, 2004).

9. Conclusions

The results obtained in the present meta-analysis extend previous findings by showing that specific cognitive-emotion processes could be essential psychological mechanisms for explaining the pathways through which insecure attachment may increase the vulnerability to depression. However, further studies are needed to corroborate our results, particularly among children and adolescents and clinical samples. Specifically, future longitudinal studies should clarify the interplay of these mediators along with other interpersonal factors between insecure attachment and depression.

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Table 1

Main characteristics of the included studies

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Aderka et al. (2009) Israel	102	M_{age}=29.5, *SD*=9.0 70.6%	CS	Baron & Kenny steps (1986)	ECR	SoCS SBS LSAS-SR	BDI	- Social Anxiety	**5**
Altin & Terzi (2010) Turkey	146	M_{age}=20.34, *SD*=1.68 22.2%	CS	Baron & Kenny steps (1986)	RSQ	MRQ	BDI	- Relational satisfaction *Dependence* - Relational monitoring	**4**
Besser & Priel (2008) Israel	113	M_{age}=72.08, *SD*=3.55 46%	CS	Baron & Kenny steps (1986)	RQ	DEQ	CES-D	*Dependence* - Neediness	**5**
Beyderman & Young (2016) UK	100	M_{age}=46.60, *SD*=10.43 60%	CS	PROCESS Bootstrapping	ECR	RRS	DID	*Cognitive hyperactivating strategies* *Repetitive thinking* - Brooding rumination	**5**
Bishop et al. (2018) US	251	M_{age}=19.45 Range 18-25. 40.4%	CS	Path analyses SEM	ERC-R	IRRBS	PHQ	- Role balance	**6**
Boo (2010) US Thesis	218	M_{age}=21.5, *SD*=3.4 78.4%	CS	SEM	AAQ ECR-R	RSE	BDI-II CES-D	- Self-Esteem	**5**
Bosacki et al. (2007) Canada	7290	M_{age}=15, *SD*=1.4 52%	CS	Baron & Kenny steps (1986) Sobel Test	IPPA	RSE	CES-D	- Self-esteem	**6**
Bozanoglu et al. (2017) Turkey	374	M_{age}=16.08 59%	CS	SEM Bootstrapping	IPPA	BAFL	BSI	- Gap between experience and language	**5**
Brenning et al. (2012) Belgium	Study 1: 339 Study 2: 746	M_{age}=12.6, *SD*=0.67 63% M_{age}=12, *SD*=1.23 59%	CS	SEM	ECR-R	ERI	CDI	- Emotion dysregulation	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Burnette et al. (2009) US	221	M_{age}=19.30, *SD*=15.85 64%	CS	SEM	ECR-R	TFS IRI RRQ	CES-D	*Cognitive hyperactivating strategies* *Repetitive thinking* - Reflection rumination - Empathy (lack) - Forgivingness	**3**
Cantazaro & Wei (2010) US	424	M_{age}=19.45, *SD*=1.88 62%	CS	SEM Bootstrapping	ECR	DEQ PSI-II	SRDS CES-D DASS	- Dependence - Self-Criticism	**5**
Chaowiang (2008) US Thesis	950	M_{age}=17, *SD*=0.9 56%	CS	Multiple regressions analysis	IPPA	ACSQ	CES-D	*Dysfunctional attitudes* -Negative cognitive Styles	**5**
Chen et al., 2018 China	1955	M_{age}=14.85, *SD*=2.86 50%	CS	PROCESS Bootstrapping	IPPA	ERQ	CES-D	*Cognitive hyperactivating strategies* - Cognitive reappraisal *Emotional dysregulation* - Expressive suppression	**7**
Chi Kuan & Bond (2010) Hong Kong & US	359	Hong Kong=150 M_{age}=20.44, *SD*=1.90 54% US=209 M_{age}=19.03, *SD*=1.23 52.1%	CS	SEM	ECR	RSS SSQ	CES-D	- Perceived Social Support from romantic partner - Relationship Satisfaction with romantic partner	**5**
Clout & Brown (2016) Australia	105	M_{age}=31.6, *SD*=4.35 100%	LO	Baron & Kenny steps (1986) Bootstrapping	ECR ECR-R	DAS	DASS EPDS	- Emotional dysregulation *Relational satisfaction* - Dyadic satisfaction	**6**
Cohen et al. (2013) China	1150	M_{age}=16.26 [14,19] 52%	LO	Multilevel mediation Bootstrapping	AAQ	ALEQ	CES-D	- Interpersonal stressors	**7** **4**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Cooley et al. (2010) US	93	M_{age}=20.66, *SD*=5.55 100%	CS	Baron & Kenny steps (1986)	RQ	ICQ	BDI-II	*Behavioral hyperactivating strategies*: - Conflict management	
Cooper-Newark (2015) UK Thesis	225	M_{age}=17 44.4%	CS	PROCESS macro Bootstrap	ECR-R-GSF	IIP-SC	BDI-II	Affiliative interpersonal problems (Low/High): - Vindictive - Cold - Socially Avoidant - Nonassertive - Exploitable - Overly Nurturant - Intrusive - Domineering	**5**
Cruddas et al. (2012) UK	92	M_{age}=24.26, *SD*=7.84 87%	CS	Baron & Kenny steps (1986) Sobel test	AAS	ITQ-FD	DASS	- Fear of self-disclosure	**3**
Dagnino et al. (2017) Chile	70	M_{age}=41.47, *SD*=12.91 83%	CS	MACRO (Preacher & Hayes) Bootstrap	ECR	DEQ SSQ-short form	BDI	- Self-criticism - Dependence	**5**
Eberhart & Hammen (2010) US	104	M_{age}=18.82, *SD*=1.24 100%	LO	Baron & Kenny causal steps (1986) Sobel test	ECR-R	Daily Diary Romantic Life Stress Interview	BDI-II	*Relational conflict* - Romantic Conflict Stress	**6**
Farinelli & Guerrero (2011) US	194	M_{age}=67.57, *SD*=10.34 68%	CS	Baron & Kenny causal steps (1986) Sobel test	Attachment questionnaire (Guerrero, Farinelli & McEwan, 2009)	Kunce and Shaver's caregiving scale	CES-D	- Over- involved caregiving	**4**
Felton & Jowett (2015) UK	241	M_{age}=20.74, *SD*=2.23 64%	CS	Bootstrapping MEDIATE macro	CAAS	PNTS	BSI	- Need of thwarting sport	**5**
Gaylord-Harden et al. (2009) US	393	M_{age}=12.03, *SD*=.85 55%	LO	Baron & Kenny steps (1986) SEM	IPPA	CCSC	CDI	*Behavioural hyperactivating strategies* - Active - Support-seeking - Distraction - Avoidant	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Gnilka et al. (2013) US	180	M_{age}=21.2 74.4%	CS	Baron & Kenny steps (1986) Bootstrapping	ECR-R	APS-R	KDS	- Maladaptive perfectionism	**5**
Graham (2018) UK Thesis	53	M_{age}=15.52, *SD* = 1.15 75% female	CS	PROCESS Boostraping	AAQ	SCS RSE	RCADS	- Self-compassion - Self-esteem	**5**
Gülüm & Dag (2014) Turkey	Study 1. 992 Study 2. 875	M_{age}=20.70, *SD*=2.22 66.6% M_{age}=21.1, *SD*=1.90 66.4%	CS	SEM Baron & Kenny steps (1986) Sobel test	ECR-R	LCS RTQ	BDI	- Locus of Control - Repetitive thinking	**3**
Halpern et al. (2012) Canada	189 ambulance workers	M_{age}=37.4, *SD*=9.2 38%	CS	Stepwise regression analysis (Baron & Kenny, 1986).	RSQ	Five components of the acute stress reaction	CES-D	- Slower recovery from social withdrawal - Physical arousal following the critical incident	**2**
Han & Lee (2011) US	134	M_{age}=21.44, *SD*=1.50 57.3%	CS	Stepwise regression analysis (Baron & Kenny, 1986) Sobel test	IPPA	SOC	CES-D	- Low sense of coherence	**4**
Hankin et al. (2005) ÚS	**Study 2** 202 **Study 3** 233	M_{age}=19.5, *SD*=2.08 75% M_{age}=18.6, *SD*=0.84 70%	LO	SEM	AAS	DAttS RSE NLEQ	IDD	- Dysfunctional attitudes - Low self-esteem - Interpersonal stressors	**6**
Hopkins et al. (2018) US	796	M_{age}=4.44 50.9%	LO	Path analysis SEM Bootstrapping	AQS	CBQ	DISC-YC	Effortful control	**9**
Irons & Gilbert (2005) UK	140	M_{age}=14.63 45%	CS	Stepwise regression analysis (Baron & Kenny, 1986)	AQ-C	ASCS-R ASBS	CDI	*Social comparison* - Social rank - Dependence	**4**
Joeng et al. (2017) South Corea	473	M_{age}=25.24, *SD*=3.78 39%	CS	SEM	ECR-R	SCS FSSS	CES-D	Self-compassion	**5**
Kamkar et al. (2012) Canada	140	M_{age}=12.65, *SD*=.70 62.14%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	ARSQ CASQ-R	SDQ-II-GSE	CDI	*Dysfunctional attitudes* - Attributions for negative events - Self-esteem	**5**
Kang et al. (2014) UK	254	Postpartum group: M_{age}=32.30, *SD*=3.53 Non-postpartum group: M_{age}=35.75, *SD*=3.43	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	RQ	RSE	BDI	- Low self-esteem	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
		100%							
Keleher et al. (2010) US	163	M_{age}=30, *SD*=11.21 100%	CS	SEM Bootstrapping	ECR-S	LIHS MSPSS	DASS	*Perceived social support* - Perceived general support of others - Positive Feelings about being a Lesbian	**5**
Kenney (2006) US Thesis	5065	M_{age}=- *SD*=- Early-late adolescents 51.82%	CS	Multiple regressions	Parent-child attachment survey	RSE	CES-D	- Self-esteem	**5**
Kenny et al. (1993) US	207	Mage=13.17, SD=.43 44.4%	CS	SEM	PAQ	SPPA	CDI	- Low self-esteem	**5**
Kenny & Sirin (2006) US	81	M_{age}=25.98, *SD*=1.42 39.5%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	PAQ	ASPP	CES-D	- Low self-esteem	**5**
Kidd & Sheffield (2005) UK	191	M_{age}=27, *SD*=4 73.8%	CS	ANCOVA	AAS-R	STAI-II PSSQ	GHQ-28	- Anger - Social support	**3**
Koroly (2017) US Thesis	222	With partner: M_{age}=31.52, *SD*=11.10 77.2% Single: M_{age}=29.24, *SD*=11.05 75.6%	CS	Bootstrap	ECR-S	IOS Scale	CES-D	- Low sense of coherence *Dependence* - Desire for closeness to best friend - Desire for closeness to romantic partner	**6**
Kullik & Petermann (2013) Germany	248	M_{age}=14.41, *SD*=1.39 51.2%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Bootstrapping	IPPA	REQ	CES-D	*Cognitive hyperactivating coping strategies* - Internal emotion regulation *Behavioural hyperactivating coping strategies* - External emotion	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
								regulation	
Land (2012) US Thesis	120	M_{age}=22, *SD*=2.87	CS	Baron & Kenny steps	ECR-S	RRS	CES-D	*Cognitive hyperactivating strategies* *Repetitive thinking* -Brooding rumination	**4**
Leal (2018) US/Mexico Thesis	235 360	Mexican-american sample: M_{age}= 22.77 (SD = 3.77) 63.80% Mexican sample: M_{age} = 19.83, *SD*= 2.02 45.60%	CS	PROCESS Bootstrap	ECR-S	Shere's Social self-efficacy Scale	CESD-R	- Social self-efficacy	**5**
Lecompte et al. (2014) Canada	68	T1: M_{age}=3.7, *SD*=4.4 T2: M_{age}=11.7, *SD*=4.3 48.5%	LO	Hierarchical multiple regressions (Baron & Kenny, 1986) Bootstrapping	Separation-reunion procedure	SPPC	DIC- DS	- Low self-esteem	**6**
Lee & Hankin (2009) US	350	M_{age}=14.5, *SD*=1.4 57%	LO	SEM	ECR	CDAS SPPC	CDI	- Dysfunctional attitudes - Self-esteem	**8**
Lee & Koo (2015) Korea	176	M_{age}=32.84, *SD*=3.45 100%	CS	Process Bootstrapping	K-RQ	MES K-RSE	K-BDI	- Low self-esteem	**5**
Li et al. (2015) Italy China	2632	China=1305 M_{age}=14.07, *SD*=1.37 49.6% Italy=1327 M_{age}=13.84, *SD*=1.46 53.05%	CS	SEM Bootstrapping	IPPA-R	ASC	CDI	- Self-control	**6**
Linares et al. (2016) Spain	505	M_{age}=26.72, *SD*=11.16 76.3%	CS	PROCESS Bootstrapping	RQ	FFMQ	CES-D	- Metacognition	**6**
Lindsay (2007) US Thesis	117	Mage = 12.6, SD=1.03 60%	CS	Path analyses	PAQ	RRS	CES-D	*Cognitive hyperactivating strategies* *Repetitive thinking* -Brooding rumination -Reflection rumination	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Liu (2006) Taiwan	1144	M_{age}=14, [13-14] 45.63%	CS	SEM	CPS	CESBQ PSS-Fr	CDI	*Perceived social support* - Peer support - Social expectation	**5**
Lopez et al. (2001) US	55	M_{age}=21.75, *SD*=4.74 69.09%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986)	ECR-S	PF-SOC	DACL	- Deactivating coping strategies - Cognitive hyperactivating coping strategies	**5**
Love & Murdock (2012) US	167	M_{age}=20.5, *SD*=2.39 56%	CS	SEM	PAQ	SEQ-G TI-GT	COPAS-D	- Low self-esteem -Trustworthiness	**5**
Marchand-Reilly (2009) US	110	M_{age}=19.85 75.45%	CS	Baron & Kenny steps	AAS	CRBQ	CES-D	- Attacking conflict behaviours	**4**
Marganska et al. (2013) US	284	M_{age}=20.5, *SD*=4.8 80.9%	CS	SEM Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	RSQ	DERS	BDI-II	- Emotion dysregulation	**5**
Margolese et al. (2005) Canada	134	M_{age}=16.95, *SD*=.74 65.7%	CS	Hierarchical regression analysis	RQ	Vignette task: coping items about rumination and maladaptive attributions	BDI	*Dysfunctional attitudes* - Maladaptive attributions *Cognitive hyperactivating coping strategies* *Repetitive thinking* - Rumination	**5**
Marks et al. (2016) Australia	343	M_{age}=33.93, *SD*=12.29 78.13%	CS	SEM Bootstrap	ECR	AES	GHQ-28	- Emotional intelligence	**5**
Martin (2001) US Thesis	112	M_{age}=43.3, *SD*=14.1 56%	CS	Hierarchical Regression Analysis	RQ	CTI	SRDS	*Dysfunctional attitudes* -Cognitive Triad	**6**
Martin (2008) US Thesis	174	M_{age}=32, *SD*=9.9 0%	CS	Regression Analysis	ASQ	ICG-R	BDI-II	Complicated Grief	**5**
McDermott et al. (2015) US	2644	M_{age}=22.5, *SD*=5.26 46%	CS	SEM Bootstrapping	ECR-S	ATHS	CCAPS-62	- Hope	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Mendes (2019) Portugal	91 adults	M_{age}=24, *SD*=5.26 100%	CS	SEM	AQ-C	SSPS	DASS	- Social safeness	**3**
Merlo (2005) US Thesis	150	M_{age}=15.75, *SD*=1.13 53%	CS	Baron & Kenny steps Bootstrap	AAQ	CSI	CES-D	*Behavioral hyperactivating strategies* -Coping strategies	**5**
Milne and Greenway (2007) *Australia*	82	M_{age}=15.25, *SD*=0.68 63%	CS	Regression analyses Sobel test	IPPA-Parent	DEQ-A SII IPPA-Peers	SRDS	- Peer attachment - Anaclictic depression - Separation-individuation - Introjective depression	**3**
Mohammadkhani et al. (2018) Iran	175	M_{age}= 21, *SD* = 2.75 57.7%	CS	PROCESS Bootstrapping	AAQ	RRS	BDI-II	*Cognitive hyperactivating coping strategies* *Repetitive thinking* - Brooding rumination	**3**
Monti & Rudolph (2014) US	417	M_{age}=37.83, *SD*=6.51 100%	LO	SEM Bootstrapping	RSQ	EAQ	MASQ	- Alexithymia	**7**
Ng & Hou (2017) China	284	M_{age}=21.75, *SD*=2.43 82.4%	CS	SEM	ECRRS (Chinese version)	10 items Non-validated	BDI-II	- Contentment-Intensity - Contentment-Duration	**5**
Nichols (2005) UK Thesis	147	M_{age}=23.78, *SD*=7.37 81.8%	LO	Baron & Kenny steps	ECR-S PBI	The Defeat Scale, Social Comparison scale	The Symptom Check List - 90 Depression Subscale	Involuntary Defeat Strategy	**5**
Owens et al. (2018) US	336	M_{age}=19.26, *SD* = 3.70 64%	CS	PROCESS Bootstrapping	ECR-S	DERS	DASS	- Emotional dysregulation *Alexithymia* - Lack of awareness	**6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Paech et al. (2015) Germany	343	M_{age}=34.0 38.2%	CS	SEM Bootstrapping	ECRQ	Ryff's scales of Psychological Well-being-short version	CES-D	*Social self-efficacy* - Environmental mastery *Relational satisfaction* - Positive relations with others	**5**
Permuy et al. (2010) Spain	164	M_{age}=21.26, *SD*=2.30 86.8%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	RQ	PSI-II	BDI	- Dependence *Self-criticism* - Sociotropy - Autonomy	**4**
Pickard et al. (2016) Australia	151	M_{age}=21.28, *SD*=5.89 73.5%	CS	PROCESS Bootstrapping	RQ	FFMQ DERS	DASS-42	- Mindfulness - Emotional dysregulation	**5**
Puissant et al. (2011) Belgium	225	M_{age}=15.67, *SD*=1.83 72%	CS	Multiple regression model	IPPA AQ-C	ASCS-R ASBS	CES-D	- Dependence *Social comparison* - Social rank	**4**
Reinecke & Rogers (2001) US	54	M_{age}=38, *SD*=13.6 57.4%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986)	AAS-R	DAttS	BDI	Dysfunctional attitudes	**5**
Reis & Grenyer (2002) Australia	245	M_{age}=21.38, *SD*=5.88 75.9%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986)	RSQ RQ	MPS	BDI DEQ	*Maladaptive perfectionism* - Socially prescribed perfectionism - Self-Oriented perfectionism	**5**
Riggs et al. (2009) US	317	M_{age}=21.01, *SD*=3.65 66%	CS	SEM	RSQ	STAI-T RSE	CES-D	- Chronic Anxiety	**6**
Roberts et al. (1996) US	255	M_{age}=20.3, *SD*=5.1 62.8%	LO	Multiple regression	AAS	DAttS RSE	IDD	- Dysfunctional attitudes - Self-esteem	**4**
Roelofs et al. (2011) Netherlands	222	M_{age}=14.7, *SD*=1.6 62.1%	CS	Regression analysis Bootstrapping	IPPA	YSQ	BDI-II	- Early maladaptive schemas	**5** **6**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
Rosen Marsh (2013) UK Thesis	356	M_{age}=34.4, *SD*=10.9 77.3%	CS	Multiple mediation bootstrapping analyses PROCESS	ECR-S	SCS-SF FSCRS RRS	CESD-SF	- Self-criticism - Self-compassion - Brooding rumination - Hated self-criticism	
Rosenthal et al. (2014) UK	104	20–30 years old 68.3%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Bootstrapping	ECRRS-partner subscale	Group identification	BDI	- Group identification	**6**
Ruitjen et al. (2011) Netherlands	455	M_{age}=14.3, *SD*=1.3 55.8%	CS	Bootstrapping	IPPA	RRS	BDI-II	*Cognitive hyperactivating coping strategies* *Repetitive thinking* - Rumination	**6**
Safford et al. (2004) US	167	M_{age}=18.64, *SD*=2.32 65.3%	CS	Hierarchical regression analysis	PBI IPPA AORI RAAS	CSQ	MASQ BDI	*Dysfunctional attitudes* - Cognitive style	**5**
Şenkal & Işikli (2015) Turkey	417	*M*=19.9, *SD*=2.1 76.3%	CS	Hierarchical Regression Analysis Sobel test	ECR-R	TAS-20	BDI	- Alexithymia	**5**
Shaver et al. (2005) US	122	M_{age}=20 *Range* = 17-28 50%	CS	Hierarchical Regression Analyses	ECR	ERSS PRQC	CES-D	*Relational satisfaction* - Perceived relationship quality	**4**
Shochet et al. (2008) Australia	153	M_{age}=15.2, *SD*=1.48 50.3%	CS	Hierarchical multiple regressions (Baron & Kenny, 1986) Sobel test	PAQ	PSSM	CDI	- School connectedness	**5**
Silverman (2003) Canada Thesis	451	M_{age}=16.02, *SD*=1.39 61%	LO	SEM	RSQ RQ	PSS SSFI	BDI-II CES-D	- Perceived social support	**7**
Smagur (2018) US Thesis	301	M_{age}=19.52, *SD* = 1.24 100%	CS	SEM	ECR	SST	CES-D	*Dysfunctional attitudes* -Negative interpretation bias	**7**
Smojver-Azic et al. (2015) CroatiSuzuki	219	M_{age}=19.02, *SD*=1.14 65.29%	CS	Hierarchical Regression Analysis	ECRꟾ	BPNS Scale - general version (croatian version)	BDI-II	- Emotional adjustment - Psychological needs	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
						SACQ-emotional adjustment subscale			
Sudol (2005) US Thesis	206	M_{age}=25.4, *SD*=8.3	CS	SEM	ECR	BSRI	BDI-II CES-D	- Agency - Nurturance	**5**
Sutin & Gillath (2009) US	Study 1 454	Study 1 M_{age}=19.69, *SD*=1.66 64%	CS	Bootstrapping Sobel test	ECR	Sef-defining memory questions	MASQ	- Memory coherence - Emotional intensity - Negative affective content of memory	**5**
	Study 2 534	Study 2 M_{age}=19.3, *SD*=2.1 62%							
Suzuki & Tomoda (2015) **Japan**	342	M_{age}=13.5, *SD*=2.4 56.4%	CS	SEM	IWMQ	RSE	BDSRS-C	- Low self-esteem	**7**
Vahedi et al. (2016) **Iran**	285	*Mage*=23.60, *SD*=1.43 Range=22-26 64%	CS	SEM	AAS	CERQ	DASS	*Cognitive hyperactivating coping strategies* - Positive cognitive emotion regulation - Negative cognitive emotion regulation	**5**
Valikhani et al. (2018) **Iran**	400	M_{age}=24.75, *SD*=3.74 49.75%	CS	PROCESS Bootstrapping	~~Revised adult attachment scale~~ AAS-R	ISK; MAAS; SCoS; SCS-SF	DASS	*Cognitive hyperactivating coping strategies* - Self-knowledge - Self-control - Self-compassion - Mindfulness	**5**
Van de Walle et al. (2016) **Belgium**	Study 1 390 children	Study 1 M_{age}=11.25, *SD*=0.65 53%	CS	PROCESS Bootstrapping	ECR-RC	CRSQ-ext-Brooding subscale PTMQ	CDI CBCL Withdrawn -Depressed scale EATQ-R	*Cognitive hyperactivating coping strategies* - Repetitive thinking about negative affect - Repetitive thinking about negative affect - Repetitive	**7**
	Study 2 157 children	Study 2 M_{age}=10.91, *SD*=0.87 52%							

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
								thinking about mother	
Wang (2007) US Thesis	480	M_{age}=16.81, *SD*=0.91 50%	CS	SEM	RSQ-C	DFPS	CHI-A SAED-R ADS	- Piety	**6**
Webster (2000) US Thesis	163	M_{age}=14.41, *SD*=0.57 52.15%	CS	Regression analysis	PAQ	SSSC	CDI	- Perceived Social Support	**3**
Wei et al. (2003) US	515	M_{age}=18.93, *SD*=2.26 68%	CS	SEM Sobel test	AAS	PF-SOC	BDI	- Deactivating coping strategies - Behavioral hyperactivating coping strategies - Cognitive hyperactivating coping strategies	**5**
Wei et al. (2004)	310	M_{age}=19.27, *SD*=1.88 73%	CS	SEM Bootstrap Sobel test	ECR-S	APS-R FMPS	BHS BDI	- Maladaptive perfectionism	**5**
Wei et al. (2005)	425	M_{age}=19.38, *SD*=1.59 61%	CS	SEM Bootstrap	ECR-S	BFNE FSRQ RMLAM	CES-D SRDS	*Dependence* - Need for reassurance from others - Self-reinforcement	**5**
Wei et al. (2005)	308	M_{age}=18.31, *SD*=0.47 59%	LO	SEM Bootstrap	ECR-S	DDI UCLA-3	CES-D	- Social self-efficacy - Self-disclosure - Loneliness	**5**
Wei et al. (2005)	299	M_{age}=19.73, *SD*=2.92 68%	CS	SEM Bootstrap	ECR-S	BPNS PFQ UCLA-3	CES-D SRDS DASS	- Basic psychological needs satisfaction	**4**
Wei et al. (2006)	372	M_{age}=20.01, *SD*=1.07 59%	LO	SEM Bootstrap	ECR-S	APS-R FMPS	CES-D	*Cognitive hyperactivating coping strategies* - Ineffective coping - Maladaptive perfectionism	**7**
Wei et al. (2007)	390	M_{age}=19.38, *SD*=1.54 63%	CS	SEM Bootstrap	ECR	SDPS RSE SSE-Social	CES-D	- Social-self efficacy - Low self-esteem	**5**

Author/s (year) Country	N	Sample characteristics (M_{age} *SD*, % female)	Design	Mediation test	Attachment measure	Mediator measure	Outcome measure	Mediator/s	Quality rating
						Self-Efficacy subscale		- Self-defeating patterns	
Wijngaards-de Meij et al. (2007) Neetherland	438	M_{age}=42.2, *SD*=9.1 50%	LO	Multilevel regression analysis	AAS	RISS	ICG SCL-90 (depressio n subscale)	*Relational satifaction* -Marital satisfaction	**6**
Williams et al (2004) US	291	M_{age}=22.5, *SD*=7.20 71.5%	CS	Multiple regression (Baron & Kenny, 1986) Sobel test	ECR	LMSQ AttSQ	BDI-II BAI	*Dysfunctional attitudes* - Cognitive vulnerabilities	**3**
Ying et al. (2007) US	353	M_{age}=20.23, *SD*=1.77 50.7%	CS	Multiple regression (Baron & Kenny, 1986) Sobel test	IPPA	SOC	CES-D	- Low sense of coherence	**6**
You et al. (2015) US	Chinese sample 153	M_{age}=20.44, *SD*=1.90 54%	CS	SEM Bootstrap	ECR	SSQ CM	CES-D-10	- Perceived social support - Relational conflict	**6**
China	American sample 214	M_{age}=19.03, *SD*=1.23 53%							
Zakalik & Wei (2006) US	234	M_{age}=37, *SD*=13.52 0%	CS	SEM Bootstrap	ECR-S	GALOSI–F PPS ASSIS- PD	CES-D DASS	- Perceived discrimination	**6**
Zhu et al. (2016) US/ China	Chinese sample 363	M_{age}=19.83, *SD*=1.35 63.1%	CS	PROCESS Bootstrap	ECR-S	MSPSS	DASS	- Perceived social support	**6**
	American sample 363	M_{age}=19.83, *SD*=1.35 63.1%							

Note: Authors written in bold = Studies included in the meta-analysis; CS = Cross-sectional; LO = Longitudinal; SEM = Structural Equation Modeling; **Attachment measures:** AAQ = Adolescent Attachment Questionnaire; AAS = Adult Attachment Scale; AAS-R = Adult Attachment Scale; AORI = Attachment and Object Relations Inventory; AQ-S = Attachment Questionnaire-Sort; AQ-C = Attachment Questionnaire for Children; ARSQ = Adolescent Relationship Scale Questionnaire; CAAS = Coach–Athlete Attachment Scale; CASQ-R = Children's Attributional Style Questionnaire-Revised; CPS = Child's Perception of Security; ECR = Experiences in Close Relationships Questionnaire; ECRQ = Experiences in Close Relationships Questionnaire; ECR-R = Experiences in Close Relationships-Revised Questionnaire; ECR-RC = Experiences in Close Relationships Scale-Revised; ECRRS = Experiences in Close Relationships Relationship Structures; ECR-R-GSF = Experiences in Close Relationships-Revised- General Short Form; ECR-S = Experiences in Close Relationship Scale-Short Form; IPPA = Inventory of Parent and Peer Attachment; IPPA-R = Inventory of Parent and Peer Attachment-Revised; IWMQ = Internal Working Models Questionnaire; K-RQ = Korean Version of the Relationship Questionnaire; PAQ = Parental Attachment Questionnaire; PBI = Parental Bonding Instrument; RQ = The Relationships Questionnaire; RSQ = The Relationship Scales Questionnaire; RSQ-C = Relationships structures questionnaire-Chinese. **Mediators measures:** ACSQ = Adolescent Cognitive Style Questionnaire; AES = Assessing emotions scale; ALEQ = Adolescent Life Events Questionnaire; APS-R = Almost Perfection Scale–Revised; ATHS = Adult Trait Hope Scale; AttSQ = Attributional Style Questionnaire; ASC = Adolescent Self-Consciousness Questionnaire; ASCS-R = Adolescent Social Comparison Scale-Revised; ASBS = Adolescent Submissive Behavior Scale; ASPP = Adult Self-Perception Profile; ASSIS-PD = Acculturative Stress Scale for International Student- Perceived Discrimination; BAFL = Beliefs about the Functions of Language Scale; BAI = Beck Anxiety Inventory; BFNE = Brief Fear of Negative Evaluation; BPNS = Basic Psychological Needs Satisfaction Scale; BSRI = Bern Sex Role Inventory; CBQ = Children's Behavior Questionnaire; CCSC = Children's Coping Strategies Checklist; CDAS = Children's Dysfunctional Attitudes Scale; CERQ = Cognitive Emotion Regulation Questionnaire; CESBQ = Children's Expectation of Social Behavior Questionnaire; CM = Conflict Measure; CRBQ = Conflict-Resolution Behavior Questionnaire; RSQ-ext = Children's Response Styles Questionnaire-Extended; CSI = Coping Strategy Indicator ; CSQ = Cognitive Style Questionnaire; CTI = Cognitive Triad Inventory; DDI = Distress Disclosure Index; DAttS = Dysfunctional Attitudes Scale; DAS =

Dyadic Adjustment Scale; DEQ = Depressive Experiences Questionnaire; DEQ-A = Depressive Experiences Questionnaire for Adolescents; DERS = Difficulties in Emotion Regulation Scale; DFPS = Dual Filial Piety Scale; EAQ = Emotional Awareness questionnaire; ERI = Emotion Regulation Inventory; ERQ = Emotion Regulation Questionnaire; ERSS = Excessive Reassurance Seeking Scale; FFMQ = Five Factors Questionnaire Mindfulness; FMPS = Multidimensional Perfectionism Scale; FSCRS = Forms of Self-Criticising/Attacking & Self-Reassuring Scale; FSRQ = Frequency of Self-Reinforcement Questionnaire; FSSS = Fear of Compassion for Self-Scale; GALOSI-F = Gay and Lesbian Oppressive Situations Inventory—Frequency; ICG-R = Inventory of Complicated Grief-Revised; ICQ = Interpersonal Competence Questionnaire; IIP-SC = Inventory of Interpersonal Problems-Short Circumplex Form; IOS Scale = The Inclusion of Other in the Self; IPPA = Inventory of Parent and Peer Attachment; IRRBS = Individual and Relations Role Balance Scale; IRI = Interpersonal Reactivity Index; ISK = Integrative Self-Knowledge Scale; ITQ-FD = Interpersonal Trust Questionnaire- Fear Disclosure; K-RSE = Korean-Rosenberg Self-Esteem Scale; LCS = Locus of Control Scale; LIHS = Lesbian Internalized Homophobia Scale; LSAS-R = Liebowitz Social Anxiety Scale-Self-Report; MAAS = Mindful Attention Awareness Scale; MES = Maternal Efficacy Scale; MPS = The Multidimensional Perfectionism Scale; MRQ = Multidimensional Relationship Questionnaire; MSPSS = Multidimensional Scale of Perceived Social Support; NLEQ = Negative Life Events Questionnaire; PFQ = Personal Feelings Questionnaire; PF-SOC = Problem-Focused Style of Coping; PNTS = Psychological Need Thwarting Scale (PNTS); PPS = Perceived Prejudice Scale; PSI-II = Personal Style Inventory-II; PSS = Perceived Social Support Scale; PSS-Fr = Perceived Social Support –Friends; PSSM = Psychological Sense Of School Membership; PSSQ = Perceived Social Support Questionnaire; PTMQ = Perseverative Thinking about Mother Questionnaire; REQ = Regulation of Emotion Questionnaire; RISS = Relational Interaction Satisfaction Scale; RMLAM = Revised Martin-Larsen Approval Motivation scale; RRQ = Rumiation-Reflecction Questionnaire; RRS = Ruminative Responses Scale; RSE = Rosenberg Self-Esteem Scale; RSS = Relationship Satisfaction Scale; RTQ = Repetitive Thinking Questionnaire ; SACQ = Student Adaptation to College Questionnaire; SBS = Submissive Behavior Scale; SCoS = Self-Control Scale; SDPS = Self-Defeating Personality Scale; SoCS = Social Comparison Scale; SCS = Self-Compassion Scale; SCS-SF = Self-Compassion Scale Short Form; SDQ-II-GSE = Self-Description Questionnaire II, General Self-Esteem; SEQ = Self-Steem Questionnaire; SOC = Sense of Coherence; SPPA = Self-Perception Profile for Adolescents; SPPC = Self-Perception Profile for Children; SSI = Separation-Individuation Inventory; SSPS = Social Safeness and Pleasure Scale; SSQ = Social Support Questionnaire; SSFI = Social Support Functions Inventory; SSSC = Social Support Scale for Children; SST = Scrambled Sentences Test; STAI-II = State Trait Anger Inventory-2 version; TAS-20 = Toronto Alexithymia Scale; TFS = Trait Forgivingness Scale; TI-GT = Trust Inventory Generalized Trust Subscale; UCLA-3 = UCLA Loneliness Scale–Version 3; YSQ = Young Schema Questionnaire. **Outcome measure:** ADS = Adolescent Depression Scale; BDI = Beck depression inventory; BDI-II = Beck Depression Inventory-II; BDSRS-C = Birleson Depression Self-Rating Scale for Children; BHS = Beck Hopelessness Scale; BSI = Symptom Inventory; CBCL = Child Behavior Checklist; CCAPS-62 = Counseling Center Assessment of Psychological Symptoms-62; CES-D = Center for Epidemiological Studies Depression Scale; CESD-R = Center for Epidemiological Studies Depression Scale Revised; CES-D-10 = Center for Epidemiological Studies Depression Scale-10 items; CESD-SF = Center for Epidemiological Studies Depression Short Form; CDI = Children's Depression Inventory; CHI-A = Chinese Happiness Inventory-Adolescent; COPAS = Comprehensive Personality and Affect Scales; DACL = Depression Adjective Checklist, Forms F and G; DASS = Depression Anxiety Stress Scale-short version; DASS-42 = Depression Anxiety Stress Scale; DEQ = Depressive Experiences Questionnaire; DIC-DS = Dominic Interactive Questionnaire- Depression subscale; DID = Diagnostic Inventory of Depression; DISC-YC = Diagnostic Interview Schedule for Children-Parent Scale—Young Child; EATQ-R = The Early Adolescent Temperament Questionnaire-Revised; EPDS = Edinburgh Postnatal Depression Scale; GHQ-28 = General Health Questionnaire-28; ICG = Inventory of Complicated Grief; IDD = Inventory to Diagnose Depression; K-BDI = Korean-Beck Depression Inventory; KDS = Kandel Depressive Symptoms; MASQ= Mood And Anxiety Symptoms Questionnaire; PHQ = Patient Health Questionnaire; RCADS = Revised Child Anxiety and Depression Scale-Short Version; SCL-90 Depression = Symptom Checklist-90; SAED-R = Scale of Assessing Emotional Disturbance-Revised; SRDS = Self-Rating Depression Scale; SRDS = Zung Self-Rating Depression Scale.

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Table 2

Quality assessment of the included studies

	Aim clear	Design appropriate to aim	Sample representative	Psychometric characteristics	Acceptable methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control confounding factors	Final Rating
Aderka et al. (2009)	1	1	0	1	1	0	0	1	0	**5**
Altin & Terzi (2010)	1	1	0	1	0	0	0	1	0	**4**
Besser & Priel (2008)	1	1	1	0	0	0	0	1	1	**5**
Beyderman & Young (2016)	1	1	0	1	1	0	0	1	0	**5**
Bishop et al. (2018)	1	1	0	1	1	0	0	1	1	**6**
Boo (2010) Thesis	1	1	0	1	1	0	0	1	0	**5**
Bosacki et al. (2007)	1	1	1	1	0	0	0	1	1	**6**
Bozanoglu et al. (2017)	1	1	0	1	1	0	0	1	0	**5**
Brenning et al. (2012)	1	1	0	1	1	0	0	1	0	**5**
Burnette et al. (2009)	1	1	0	0	1	0	0	0	0	**3**
Cantazaro & Wei (2010)	1	1	0	1	1	0	0	1	0	**5**
Chaowiang (2008) Thesis	1	1	0	1	0	0	0	1	1	**5**
Chen et al. (2018)	1	1	1	1	1	0	0	1	1	**7**
Clout & Brown (2016)	1	1	1	1	0	0	0	1	1	**6**
Chikuan & Bond (2010)	1	1	0	0	1	0	0	1	1	**5**
Cohen et al. (2013)	1	1	1	1	1	0	0	1	1	**7**
Cooley et al. (2010)	1	1	0	1	0	0	0	1	0	**4**
Cooper-Newark (2015) Thesis	1	1	0	1	1	0	0	1	0	**5**
Cruddas et al. (2012)	0	1	0	1	0	0	0	1	0	**3**
Dagnino et al. (2017)	1	1	0	1	1	0	0	1	0	**5**
Eberhart & Hammen (2010)	1	1	0	1	1	0	0	1	1	**6**
Farinelli & Guerrero (2011)	1	1	0	1	0	0	0	1	0	**4**
Felton & Jowett (2015)	1	1	0	1	1	0	0	1	0	**5**
Gaylord-Harden et al. (2009)	1	1	0	1	1	0	0	1	1	**6**
Gnilka et al. (2013)	1	1	0	1	1	0	0	1	0	**5**
Graham (2018) UK Thesis	1	1	0	1	1	0	0	1	0	**5**
Gülüm & Dag (2013)	1	1	0	1	0	0	0	0	0	**3**
Halpern et al. (2012)	0	1	0	1	0	0	0	0	0	**2**
Han & Lee (2011)	0	1	0	1	0	0	0	1	1	**4**
Hankin et al. (2005)	1	1	0	1	1	0	0	1	1	**6**
Hopkins et al. (2019)	1	1	1	1	1	1	1	1	1	**9**
Irons & Gilbert (2005)	1	1	0	1	0	0	0	1	0	**4**
Joeng et al. (2017)	1	1	0	1	1	0	0	1	0	**5**
Kamkar et al. (2012)	1	1	0	1	0	0	0	1	1	**5**
Kang et al. (2014)	1	1	0	1	0	0	0	1	1	**5**
Keleher et al. (2010)	1	1	0	1	1	0	0	1	0	**5**
Kenney (2006) Thesis	1	1	1	1	0	0	0	0	1	**5**
Kenny et al. (1993)	1	1	0	1	1	0	0	1	0	**5**
Kenny & Sirin (2006)	1	1	0	1	0	0	0	1	1	**5**
Kidd & Sheffield (2005)	1	1	0	0	0	0	0	1	0	**3**
Korolly (2017) Thesis	1	1	0	1	1	0	0	1	1	**6**
Kullik & Petermann (2013)	1	1	0	1	1	0	0	1	1	**6**
Land (2012) Thesis	1	1	0	1	0	0	0	1	0	**4**
Leal (2018) Thesis	1	1	0	1	1	0	0	1	0	**5**
Lecompte et al. (2014)	1	1	0	1	1	0	0	1	1	**6**
Lee & Hankin (2009)	1	1	1	1	1	1	0	1	1	**8**

	Aim clear	Design appropriate to aim	Sample representative	Psychometric characteristics	Acceptable methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control confounding factors	Final Rating
Lee & Koo (2015)	1	1	0	1	1	0	0	1	0	**5**
Li et al. (2015)	1	1	0	1	1	0	0	1	1	**6**
Linares et al. (2016)	1	1	0	1	1	0	0	1	1	**6**
Lindsay (2007) Thesis	1	1	0	1	1	0	0	1	0	**5**
Liu (2006)	0	1	1	1	1	0	0	1	0	**5**
Lopez et al. (2001)	1	1	0	1	0	0	0	1	1	**5**
Love & Murdock (2012)	1	1	0	1	1	0	0	1	0	**5**
Marchand-Reilly (2009)	1	1	0	1	0	0	0	1	0	**4**
Marganska et al. (2013)	1	1	0	1	1	0	0	1	0	**5**
Margolese et al. (2005)	1	1	0	1	0	0	0	1	1	**5**
Marks et al. (2016)	1	1	0	1	1	0	0	1	0	**5**
Martin (2001) Thesis	1	1	1	1	0	0	0	1	1	**6**
Martin (2008) Thesis	1	1	1	1	0	0	0	1	0	**5**
McDermott et al. (2015)	1	1	1	1	1	0	0	1	0	**6**
Mendes (2019)	0	1	0	0	1	0	0	1	0	**3**
Merlo (2005) Thesis	1	1	0	1	1	0	0	1	0	**5**
Milne & Greenway (2007)	1	1	0	0	1	0	0	0	0	**3**
Mohammadkhani et al. (2018)	1	1	0	0	1	0	0	0	0	**3**
Monti & Rudolph (2014)	1	1	0	1	1	1	1	1	0	**7**
Ng & Hou (2017)	1	1	0	1	1	0	0	1	0	**5**
Nichols (2005) Thesis	1	1	1	1	0	0	0	1	0	**5**
Owens et al. (2018)	1	1	1	1	1	0	0	1	0	**6**
Paech et al. (2015)	0	1	1	1	1	0	0	1	0	**5**
Permuy et al. (2010)	1	1	0	1	0	0	0	1	0	**4**
Pickard et al. (2016)	1	1	0	1	1	0	0	1	0	**5**
Puissant et al. (2011)	1	1	0	0	0	0	0	1	1	**4**
Reinecke & Rogers (2001)	1	1	1	1	0	0	0	1	0	**5**
Reis & Grenyer (2002)	1	1	0	1	0	0	0	1	1	**5**
Riggs et al. (2009)	1	1	0	1	1	0	0	1	1	**6**
Roberts et al. (1996)	1	1	0	1	0	0	0	1	0	**4**
Roelofs et al. (2011)	1	1	1	0	1	0	0	1	0	**5**
Rosen Marsh (2013) Thesis	1	1	1	1	1	0	0	1	0	**6**
Rosenthal et al. (2014)	1	1	1	1	1	0	0	1	0	**6**
Ruitjen et al. (2011)	1	1	1	1	1	0	0	1	0	**6**
Safford et al. (2004)	1	1	1	1	0	0	0	0	1	**5**
Şenkal & Işikli (2015)	1	1	1	1	0	0	0	1	0	**5**
Shaver et al. (2005)	1	1	1	0	0	0	0	1	0	**4**
Shochet et al. (2008)	1	1	1	1	0	0	0	1	0	**5**
Silverman (2003) Thesis	1	1	1	1	1	0	0	1	1	**7**
Smagur (2018) Thesis	1	1	1	1	1	0	0	1	1	**7**
Smojver-Azic et al. (2015)	1	1	1	1	0	0	0	1	0	**5**
Sudol (2005) Thesis	1	1	0	1	1	0	0	1	0	**5**
Sutin & Gillath (2009)	1	1	0	1	1	0	0	1	0	**5**
Suzuki & Tomoda (2015)	1	1	1	1	1	0	0	1	1	**7**
Vahedi et al. (2016)	1	1	0	1	1	0	0	1	0	**5**
Valikhani et al. (2018)	1	1	0	1	1	0	0	1	0	**5**
Van de Walle et al. (2016)	1	1	1	1	1	0	0	1	1	**7**
Wang (2007) Thesis	1	1	1	1	1	0	0	1	0	**6**
Webster (2000) Thesis	1	0	0	1	0	0	0	1	0	**3**
Wei et al. (2003)	1	1	0	1	1	0	0	1	0	**5**
Wei et al. (2004)	1	1	0	1	1	0	0	1	0	**5**

	Aim clear	Design appropriate to aim	Sample representative	Psychometric characteristics	Acceptable methods of data analysis	Changes in M preceded changes in Y	Changes in X preceded changes in M	Clear findings	Control confounding factors	Final Rating
Wei et al. (2005b	1	1	0	1	1	0	0	1	0	**5**
Wei et al. (2005c)	1	1	0	1	1	0	0	1	0	**5**
Wei et al. (2005a)	1	1	0	1	1	1	1	1	0	**4**
Wei et al. (2006)	1	1	0	1	1	1	1	1	0	**7**
Wei et al. (2007)	1	1	0	1	1	0	0	1	0	**5**
Wijngaardsde et al. (2007)	1	1	1	1	0	0	0	1	1	**6**
Williams et al (2004)	1	1	0	0	0	0	0	1	0	**3**
Ying et al. (2007)	1	1	1	1	0	0	0	1	1	**6**
You et al. (2015)	1	1	1	1	1	0	0	1	0	**6**
Zakalik & Wei (2006)	1	1	1	1	1	0	0	1	0	**6**
Zhu et al. (2016)	1	1	0	1	1	0	0	1	1	**6**

Table 3

Random effects pooled correlation coefficients of path a, path b, indirect effect and total effect; heterogeneity and mediation ratio

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Total	141	0.07 (0.02-0.12)	0.97	0.05 (-0.01-0.11)	0.97	0.16 (0.11-0.21)	0.97	0.06 (0.04-0.08)	0.81	0.38
Clinical sample	7	0.46 0.27 0.62	0.70	0.13 -0.15 0.39	0.91	0.16 (-0.07-0.37)	0.88	0.13 (0.01-0.24)	0.09	0.81
Non clinical sample	134	0.05 0.01 0.10	0.97	0.05 -0.02 0.11	0.98	0.16 (0.11-0.21)	0.97	0.05 (0.03-0.07)	0.81	0.31
Anxious	74	0.09 (0.01-0.16)	0.97	0.08 (-0.01-0.18)	0.98	0.37 (0.34-0.40)	0.76	0.11 (0.09-0.13)	0.57	0.30
Avoidant	64	-0.02 (-0.10-0.07)	0.97	0.03 (-0.07-0.13)	0.98	0.25 (0.22-0.28)	0.82	0.09 (0.07-0.12)	0.50	0.36
Children/adolescents	48	0.03 (-0.05-0.11)	0.97	-0.01(-0.09-0.08)	0.98	-0.03 (-0.10-0.04)	0.97	0.01 (-0.03-0.04)	0.80	0.33
Adults	93	0.09 (0.03-0.15)	0.97	0.08 (-0.01-0.17)	0.98	0.26 (0.21-0.30)	0.92	0.09 (0.06-0.11)	0.73	0.35
High quality	53	0.07 (-0.01-0.14)	0.97	0.06 (-0.04-0.16)	0.98	0.17 (0.10-0.25)	0.98	0.06 (0.03-0.09)	0.72	0.35
Low quality	88	0.07 (0.01-0.13)	0.97	0.04 (-0.03-0.12)	0.98	0.15 (0.09-0.21)	0.96	0.06 (0.03-0.08)	0.84	0.40
Males	7	0.11 (-0.13-0.34)	0.97	0.25 (-0.40-0.74)	0.99	-0.01(-0.32-0.31)	0.98	-0.01(-0.16-0.14)	0.92	1.00
Females	18	0.06 (-0.09-0.21)	0.97	0.05 (-0.36-0.45)	0.99	0.07 (-0.13-0.27)	0.98	0.01 (-0.08-0.11)	0.91	0.14
Dysfunctional attitudes	11	0.21 (0.05-0.35)	0.98	0.33 (0.19-0.46)	0.98	0.17 (-0.01-0.33)	0.97	0.07 (-0.01-0.14)	0.67	0.41
Children/adolescents	4	0.01 (-0.23-0.22)	0.98	0.30 (0.11-0.47)	0.80	0.04 (-0.21-0.28)	0.94	0.01 (-0.10-0.11)	0.60	0.25
Adults	7	0.33 (0.12-0.51)	0.94	0.34 (0.16-0.50)	0.31	0.25(0.08-0.39)	0.97	0.10 (0.01-0.20)	0.53	0.40
Low self-esteem	16	0.06 (-0.07-0.19)	0.98	-0.55 (-0.63--0.46)	0.70	0.01 (-0.14-0.15)	0.98	-0.03 (-0.09-0.03)	0.95	3.00
Children/adolescents	8	0.05 (-0.12-0.21)	0.98	-0.52 (-0.62--0.40)	0.97	0.03 (-0.15-0.21)	0.98	-0.05 (-0.13-0.03)	0.94	1.67
Adults	8	0.07 (-0.13-0.27)	0.99	-0.58 (-0.69- -0.46)	0.80	-0.01 (-0.16-0.15)	0.97	-0.02 (-0.11-0.07)	0.96	2.00
Maladaptive perfectionism	4	0.27 (0.02-0.49)	0.80	0.37 (0.14-0.56)	0.90	0.34 (0.07-0.57)	0.66	0.11 (-0.01-0.23)	0.55	0.32
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	4	0.27 (0.02-0.49)	0.80	0.37 (0.14-0.56)	0.90	0.34 (0.07-0.57)	0.66	0.11 (-0.01-0.23)	0.55	0.32

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Self-criticism	4	0.38 (0.14-0.58)	0.98	0.46 (0.25-0.64)	0.43	0.30 (0.02-0.54)	0	0.17 (0.04-0.28)	0	0.57
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	4	0.38 (0.14-0.58)	0.98	0.46 (0.25-0.64)	0.43	0.30 (0.02-0.54)	0	0.17 (0.04-0.28)	0	0.57
Self-compassion	4	-0.26 (-0.49 --0.01)	0.90	-0.47 (-0.64--0.25)	0.71	0.23 (-0.06-0.48)	0.93	0.13 (0.01-0.24)	0	0.57
Children/adolescents	1	0.15 (-0.35-0.58)	--	-0.51 (-0.77--0.09)	--	-0.39 (-0.75-0.14)	--	-0.08 (-0.39-0.24)	--	0.21
Adults	3	-0.36 (-0.61- -0.06)	0.87	-0.45 (-0.65--0.20)	0.85	0.39 (0.16-0.57)		0.16 (0.02-0.29)	0	0.41
Low sense of coherence	2	0.21 (-0.16-0.53)	0	-0.47 (-0.70--0.16)	0.99	-0.26 (-0.59-0.15)	0.45	-0.10 (-0.28-0.09)	0	0.38
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	2	0.21 (-0.16-0.53)	0	-0.47 (-0.70--0.16)	0.99	-0.26 (-0.59-0.15)	0.45	-0.10 (-0.28-0.09)	0	0.38
Over-dependence	9	0.04 (-0.13-0.21)	0.96	0.10 (-0.07--0.26)	0	0.15 (-0.05-0.33)	0.96	0.04 (-0.05-0.12)	0.80	0.27
Children/adolescents	2	-0.10 (-0.40-0.22)	0.93	0.24 (0.04-0.49)	0.92	-0.22 (-0.52-0.14)	0.97	-0.06 (-0.22-0.10)	0.31	0.27
Adults	7	0.08 (-0.14-0.29)	0.97	0.06 (-0.14-0.24)	0.98	0.25 (0.09-0.40)	0.90	0.07 (-0.03-0.17)	0.80	0.28
Self-disclosure	2	-0.48 (-0.71 - -0.14)	0.94	0.14 (-0.21-0.46)	0.71	-0.04 (-0.42-0.36)	0.93	-0.10 (-0.27-0.08)	0.93	2.50
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	2	-0.48 (-0.71 - -0.14)	0.94	0.14 (-0.21-0.46)	0.71	-0.04 (-0.42-0.36)	0.93	-0.10 (-0.27-0.08)	0.93	2.50
Emotional dysregulation	6	0.05 (-0.16-0.26)	0.97	0.36 (-0.17-0.52)	0.99	0.13 (-0.10-0.35)	0.99	0.09 (-0.01-0.18)	0.80	0.69
Children/adolescents	2	0.12 (-0.18-0.41)	0.99	0.18 (-0.09-0.43)	0	-0.02 -0.35 0.31	0.99	0.07 (-0.06-0.20)	0.94	3.50
Adults	4	0.01 (-0.27-0.29)	0.92	0.45 (0.22-0.62)	0.97	0.21 -0.01 0.40	0.76	0.10 (-0.03-0.22)	0.14	0.48
Alexithimia	3	0.16 (-0.13-0.43)	0.96	0.07 (-0.20--0.34)	0	0.21 (-0.12-0.49)	0.89	0.07 (-0.06-0.19)	0	0.33
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	3	0.16 (-0.13-0.43)	0.96	0.07 (-0.20--0.34)	0	0.21 (-0.12-0.49)	0.89	0.07 (-0.06-0.19)	0	0.33

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
COPING: Behavioral hyperactivating strategies	5	0.02 (-0.21-0.25)	0.93	-0.02 (-0.23-0.20)	0.71	-0.01 (-0.26-0.25)	0.98	0.02 (-0.09-0.13)	0	2.00
Children/adolescents	3	-0.13 (-0.37-0.13)	0.95	-0.07 (-0.30-0.16)	0.89	0.01 (-0.28-0.29)	0.98	0.02 (-0.11-0.15)	0.23	2.00
Adults	2	0.24 (-0.16-0.58)	0	0.06 (-0.29-0.40)	0.95	-0.01 (-0.31-0.29)	0.97	0.02 (-0.16-0.20)	0	2.00
COPING: Cognitive hyperactivating strategies	20	0.14 (0.03-0.25)	0.95	0.24 (0.13-0.34)	0.99	0.18 (0.06-0.30)	0.98	0.06 (0.01-0.11)	0.72	0.33
Children/adolescents	9	0.10 (-0.05-0.24)	0.85	0.15 (0.02-0.27)	0.98	-0.10 (-0.26-0.06)	0.97	-0.01 (-0.08-0.06)	0.26	0.10
Adults	11	0.18 (0.01-0.34)	0.97	0.31 (0.17-0.44)	0.94	0.40 (0.29-0.51)	0.90	0.13 (0.05-0.20)	0.36	0.33
Repetitive thinking	11	0.25 (0.09-0.39)	0.88	0.43 (0.30-0.54)	0	0.23 (0.06-0.39)	0.91	0.11 (0.04-0.18)	0.28	0.48
Children/adolescents	5	0.06 (-0.14-0.26)	0.56	0.38 (0.22-0.53)	0.81	0.04 (-0.18-0.26)	0.88	0.04 (-0.06-0.14)	0	1.00
Adults	6	0.39 (0.18-0.57)	0.77	0.47 (0.29-0.61)	0.51	0.38 (0.22-0.52)	0.72	0.17 (0.07-0.28)	0	0.45
Rumination	2	0.06 (-0.30-0.40)	0.57	0.36 (0.02-0.62)	0.43	-0.01 (-0.39-0.38)	0.02	0.03 (-0.14-0.20)	0	3.00
Children/adolescents	2	0.06 (-0.25-0.36)	0.57	0.36 (0.02-0.62)	0.43	-0.01 (-0.39-0.38)	0.02	0.03 (-0.14-0.20)	0	3.00
Adults	0	--	--	--	--	--	--	--	--	
Brooding rumination	5	0.33 (0.11-0.53)	0.89	0.42 (0.22-0.59)	0.71	0.27 (0.02-0.49)	0.89	0.16 (0.05-0.27)	0.21	0.59
Children/adolescents	1	-0.11 (-0.52-0.34)	--	0.11 (-0.30-0.49)	--	-0.20 (-0.62-0.30)	--	-0.02 (-0.27-0.23)	--	0.10
Adults	4	0.43-0.17-0.63)	0.30	0.48 (0.27-0.66)	0.68	0.38 (0.17-0.55)	0	0.20 (0.07-0.32)		0.53
Reflection rumination	2	0.16 (-0.21-0.49)	0.95	0.38 (0.05-0.64)	0.99	0.19 (-0.21-0.54)	0.98	0.09 (-0.09-0.26)	0.71	0.47
Children/adolescents	1	-0.12 (-0.53-0.33)	--	0.32 (-0.09-0.64)	--	-0.20 (-0.62-0.30)	--	-0.03 (-0.27-0.22)	--	0.15
Adults	1	0.40 (-0.14-0.76)	--	0.44 (-0.03-0.75)	--	0.52 (0.15-0.76)	--	0.18 (-0.07-0.41)	--	0.35
Self-control	4	0.05 (-0.20--0.30)	0.98	-0.06 (-0.29-0.18)	0	0.05 (-0.23-0.32)	0.98	-0.01 (-0.11-0.10)	0	0.20
Children/adolescents	3	0.22 (-0.03-0.44)	0	-0.05 (-0.26-0.17)	0	-0.10 (-0.37-0.18)	0.45	-0.01 (-0.12-0.09)	0	0.10
Adults	1	-0.44 (-0.78- -0.09)	--	-0.10 (-0.53-0.38)	--	0.48 (0.10-0.74)	--	0.04 (-0.20-0.27)	--	0.08
COPING: Deactivating	3	0.09 (-0.21-0.38)	0.92	0.04 (-0.24-0.32)	0.71	0.08 (-0.25-0.40)	0.98	0.08 (-0.06-0.22)	0.61	1.00

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
strategies										
Children/adolescents	1	0.14 (-0.29-0.52)	--	-0.01 (-0.38-0.36)	--	-0.30 (-0.67-0.18)	--	0.01 (-0.20-0.20)	--	0.03
Adults	2	0.07 (-0.29-0.41)	0.97	0.07 (-0.29-0.41)	0.98	0.29 (-0.02-0.55)	0	0.14 (-0.06-0.32)	0	0.48
Perceived social support	11	-0.23 (-0.38 - -0.08)	0.93	-0.19 (-0.32--0.04)	0.99	0.22 (0.05-0.38)	0.91	0.06 (-0.01-0.13)	0.75	0.27
Children/adolescents	3	-0.19 (-0.42-0.07)	0.98	-0.32 (-0.51--0.10)	0.97	0.08 (-0.21-0.35)	0.98	0.10 (-0.02-0.22)	0.94	1.25
Adults	8	-0.25 (-0.43- -0.06)	0.80	-0.13 (-0.30-0.04)	0.85	0.27 (0.12-0.40)	0.47	0.04 (-0.05-0.13)	0	0.15
Relational satisfaction	7	-0.23 (-0.41 - -0.03)	0.92	-0.25 (-0.42--0.07)	0	0.24 (0.02-0.43)	0.89	0.06 (-0.04-0.15)	0	0.25
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	7	-0.23 (-0.41 - -0.03)	0.92	-0.25 (-0.42--0.07)	0	0.24 (0.02-0.43)	0.89	0.06 (-0.04-0.15)	0	0.25
Relational conflict	3	0.22 (-0.08-0.48)	0	0.22 (-0.06-0.47)	0.71	0.30 (-0.03-0.57)	0	0.05 (-0.10-0.19)	0	0.17
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	3	0.22 (-0.08-0.48)	0	0.22 (-0.06-0.47)	0.71	0.30 (-0.03-0.57)	0	0.05 (-0.10-0.19)	0	0.17
Social comparison	2	-0.11 (-0.45-0.25)	0.49	-0.33 (-0.60-0.01)	0.99	0.10 (-0.30-0.47)	0	0.03 (-0.14-0.21)	0	0.30
Children/adolescents	2	-0.11 (-0.45-0.25)	0.49	-0.33 (-0.60-0.01)	0.99	0.10 (-0.30-0.47)	0	0.03 (-0.14-0.21)	0	0.30
Adults	0	--	--	--	--	--	--	--	--	
Social self-efficacy	3	-0.22 (-0.48-0.07)	0.74	-0.26 (-0.50-0.01)	0	0.26 (-0.06-0.53)	0	0.07 (-0.06-0.20)	0.33	0.27
Children/adolescents	0	--	--	--	--	--	--	--	--	
Adults	3	-0.22 (-0.48-0.07)	0.74	-0.26 (-0.50-0.01)	0	0.26 (-0.06-0.53)	0	0.07 (-0.06-0.20)	0.33	0.27
Interpersonal stressors	2	0.21 (-0.15-0.52)	0.02	0.20 (-0.14--0.50)	0	0.24 (-0.16-0.57)	0.43	0.04 (-0.12-0.19)	0	0.17
Children/adolescents	1	0.24 (-0.19-0.59)	--	0.09 (-0.28-0.44)	--	0.28 (-0.20-0.65)	--	0.02 (-0.16-0.20)	--	0.07
Adults	1	0.17 (-0.38- 0.63)	--	0.31 (-0.18-0.68)	--	0.19 (-0.23-0.55)	--	0.06 (-0.19-0.30)	--	0.32

Note. Path *a*: association between independent variable and mediator; **Path *b*:** association between mediator and dependent variable; **Path *c*:** total effect of the independent variable on the dependent variable; ***a*b*:** the indirect effect of the independent variable on the dependent variable controlling the mediator; **I^2**: heterogeneity; **|a*b/c|:** mediation ratio. effect size in mediation analysis.

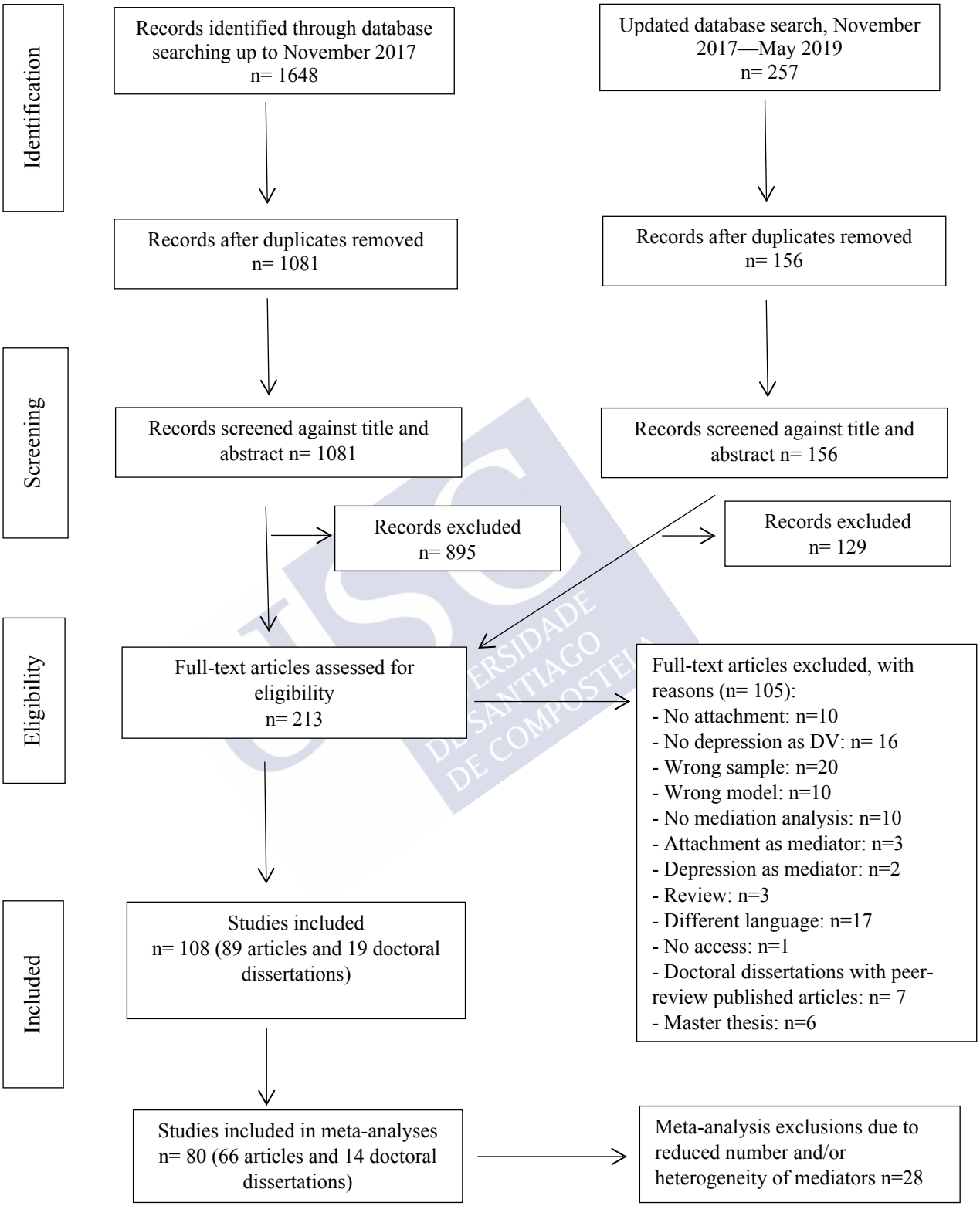

Figure 1. Flowchart for search strategy

Conflict of interest

The authors have no conflicts of interest to declare.

Author Statement

Contributors: LCG, BT, RRC and CS collaboratively contributed to the study concept and designed the meta-analysis. LCG, CS and RRC conducted the literature searches and screening of the literature. LCG provided summaries of previous research studies. LCG, RRC and CS extracted and coded the data. Statistical analyses were performed by BT. LCG wrote the first draft of the manuscript under the supervision of CS. All authors contributed to and approved the final version of the manuscript for submission.

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Supplementary Table 1

Checklist for measuring study quality

Items	Yes	No
1. Is there hypothesis/aim/objective of the study clearly described? (Objectives are formulated adequately: precise, clear and comprehensive)		
2. Is the study design appropriate to objectives?		
3. Is the study sample representative? (Participants are recruited from a representative setting that relates to the studies aims and hypotheses)		
4. Were the psychometric characteristics of the mediator and outcome variables reported? (Computed from the present study or a reference provided)		
5. Were statistically appropriate/ acceptable methods of data analysis used? (This includes the product of coefficient approach with bootstrapped confidence intervals, structural equation modelling, latent growth modelling, and causal mediation analysis)		
6. Did the study ascertain whether changes in the mediating variable preceded changes in the outcome variable?		
7. Did the study ascertain whether changes in the predictor variable preceded changes in the mediator variable?		
8. Are the main findings of the study clearly described? (Simple outcome data should be reported for all major findings so that the reader can check the major analysis and conclusions)		
9. Did the study control for possible confounding factors? (Variables that may impact on results are identified and controlled for in terms of statistical analysis)		

Supplementary Table 2

Detailed extracted and coded data for meta-analysis

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Altin & Terzi (2010) Turkey	146	Mixed	Non clinical	Adult	Other	Dependence	0.20	0.15	0.17	0.03	4
Altin & Terzi (2010) Turkey	146	Mixed	Non clinical	Adult	Other	Relational satisfaction	0.35	-0.26	-0.26	-0.09	4
Besser & Priel (2008) Israel	113	Mixed	Non clinical	Adult	Other	Dependence	-0.29	0.50	-0.25	-0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.47	0.31	0.42	0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.59	0.38	0.33	0.22	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Avoidant	Repetitive thinking	0.47	0.31	0.42	0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Anxious	Repetitive thinking	0.59	0.38	0.33	0.22	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Avoidant	Brooding rumination	0.47	0.31	0.42	0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Anxious	Brooding rumination	0.59	0.38	0.33	0.22	5
Boo (2010) US Tesis	218	Mixed	Non clinical	Adult	Other	Low self-esteem	0.83	-0.75	-0.62	-0.62	5
Bosacki et al. (2007) Canada	7290	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	-0.11	-0.24	0.11	0.03	6
Bosacki et al. (2007) Canada	7290	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	0.10	-0.29	-0.06	-0.03	6
Brenning et al. (2012) Belgium	339	Mixed	Non clinical	Chi/Ado	Anxious	Emotional dysregulation	0.49	0.16	0.42	0.08	5
Brenning et al. (2012) Belgium	339	Mixed	Non clinical	Chi/Ado	Avoidant	Emotional dysregulation	0.25	0.13	0.26	0.03	5
Brenning et al. (2012) Belgium	746	Mixed	Non clinical	Chi/Ado	Anxious	Emotional dysregulation	0.46	0.24	0.37	0.11	5
Brenning et al. (2012) Belgium	746	Mixed	Non clinical	Chi/Ado	Avoidant	Emotional dysregulation	0.22	0.22	0.39	0.48	5
Burnette et al. (2009) US	221	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.40	0.44	0.52	0.18	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adult	Anxious	Repetitive thinking	0.40	0.44	0.52	0.18	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adult	Anxious	Reflection rumination	0.40	0.44	0.52	0.18	3
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Anxious	Self-criticism	0.44	0.56	0.42	0.25	5
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Avoidant	Self-criticism	0.23	0.56	0.24	0.13	5
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Anxious	Dependence	0.65	0.28	0.42	0.18	5
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Avoidant	Dependence	-0.35	0.28	0.24	-0.10	5
Chaowiang (2008) US Tesis	950	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.36	0.4	-0.14	-0.14	5
Chaowiang (2008) US Tesis	950	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.4	0.04	-0.14	-0.02	5
Chaowiang (2008) US Tesis	950	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.49	0.03	-0.2	-0.01	5
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Emotional dysregulation	-0.12	0.17	-0.40	-0.02	7
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Emotional dysregulation	-0.11	0.17	-0.37	-0.02	7
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.25	-0.26	-0.40	-0.07	7
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.25	-0.26	-0.37	-0.07	7
Chi Kuan Mak (2010) Hong kong	150	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.61	-0.34	0.26	0.2074	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Chi Kuan Mak (2010) Hong kong	150	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.34	-0.34	0.45	0.1156	5
Chi Kuan Mak (2010) US	209	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.29	-0.23	0.22	0.0667	5
Chi Kuan Mak (2010) US	209	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.2	-0.23	0.40	0.046	5
Chi Kuan Mak & Bond (2010) China	150	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.24	-0.27	0.45	0.06	5
Chi Kuan Mak & Bond (2010) China	150	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.69	-0.27	0.26	0.19	5
Chi Kuan Mak & Bond (2010) US	209	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.15	-0.17	0.4	0.03	5
Chi Kuan Mak & Bond (2010) US	209	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.33	-0.17	0.22	0.06	5
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Avoidant	Emotional dysregulation	-0.39	-0.22	0.23	0.09	6
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Anxious	Emotional dysregulation	-0.42	-0.22	0.32	0.09	6
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Avoidant	Relational satisfaction	-0.32	-0.33	0.23	0.11	6
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Anxious	Relational satisfaction	-0.29	-0.33	0.32	0.10	6
Cohen et al. (2013) China	1150	Mixed	Non clinical	Chi/Ado	Other	Interpersonal stressors	0.24	0.09	0.28	0.02	7
Cooley et al. (2010) US	93	Female	Non clinical	Adult	Other	Coping: behavioral hyperactivating strategies	0.27	-0.2	-0.38	-0.05	4
Cruddas et al. (2012) UK	92	Mixed	Non clinical	Adult	Other	Self disclosure	-0.65	0.55	-0.27	-0.36	3
Dagnino et al. (2017) Chile	70	Mixed	Clinical	Adult	Anxious	Self-criticism	0.51	0.47	0.19	0.24	5
Dagnino et al. (2017) Chile	70	Mixed	Clinical	Adult	Avoidant	Self-criticism	0.31	0.47	0.23	0.15	5
Dagnino et al. (2017) Chile	70	Mixed	Non clinical+clinical	Adult	Anxious	Dependence	0.52	0.06	0.19	0.031	5
Dagnino et al. (2017) Chile	70	Mixed	Non clinical+clinical	Adult	Avoidant	Dependence	0.07	0.03	0.23	0.002	5
Eberhart & Hammen (2010) US	104	Female	Non clinical	Adult	Anxious	Relational conflict	0.3	0.37	0.37	0.11	6
Eberhart & Hammen (2010) US	104	Female	Non clinical	Adult	Avoidant	Relational conflict	0.15	0.37	0.15	0.06	6
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	0.13	-0.14	-0.30	-0.02	6
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	0.22	0.03	-0.30	0.01	6
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: deactivating strategies	0.13	0.04	-0.30	0.01	6
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: deactivating strategies	0.15	-0.05	-0.30	-0.01	6
Gnilka et al. (2013) US	180	Mixed	Non clinical	Adult	Avoidant	Maladaptative perfectionism	0.22	0.28	0.18	0.06	5
Gnilka et al. (2013) US	180	Mixed	Non clinical	Adult	Anxious	Maladaptative perfectionism	0.33	0.2	0.38	0.07	5
Graham (2018) UK Tesis	53	Mixed	Clinical	Chi/Ado	Other	Low self-esteem	0.22	-0.44	-0.39	-0.10	5
Graham (2018) UK Tesis	53	Mixed	Clinical	Chi/Ado	Other	Self-compasion	0.15	-0.51	-0.39	-0.0765	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.4	0.47	0.38	0.19	3
Gülum & Dag (2013) Turkey	294	Male	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.38	0.39	0.34	0.15	3
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.05	0.47	0.09	0.02	3
Gülum & Dag (2013) Turkey	294	Male	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.02	0.39	0.14	0.008	3
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Anxious	Repetitive thinking	0.4	0.47	0.38	0.19	3
Gülum & Dag (2013) Turkey	294	Male	Non clinical	Adult	Anxious	Repetitive thinking	0.38	0.39	0.34	0.15	3
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Avoidant	Repetitive thinking	0.05	0.47	0.09	0.02	3
Gülum & Dag (2013) Turkey	294	Male	Non clinical	Adult	Avoidant	Repetitive thinking	0.02	0.39	0.14	0.008	3
Han & Lee (2011) US	134	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.23	-0.3	-0.38	-0.07	4
Han & Lee (2011) US	134	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.11	-0.3	-0.29	-0.03	4
Hankin et al. (2005) US	202	Mixed	Non clinical	Adult	Anxious	Dysfuntional attitudes	0.39	0.23	0.15	0.09	6
Hankin et al. (2005) US	202	Mixed	Non clinical	Adult	Avoidant	Dysfuntional attitudes	0.31	0.23	0.27	0.07	6
Hankin et al. (2005) US	202	Mixed	Non clinical	Adult	Anxious	Low self-esteem	-0.43	-0.59	0.33	0.25	6
Hankin et al. (2005) US	202	Mixed	Non clinical	Adult	Avoidant	Low self-esteem	-0.32	-0.59	0.33	0.19	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Anxious	Interpersonal stressors	0.3	0.41	0.24	0.12	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Avoidant	Interpersonal stressors	0.22	0.41	0.13	0.09	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Anxious	Interpersonal stressors	0.05	0.2	0.24	0.01	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Avoidant	Interpersonal stressors	0.09	0.2	0.13	0.02	6
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.08	0.05	-0.36	-0.004	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Avoidant	Dependence	0.12	0.05	0.34	0.006	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Dependence	0.33	0.05	0.35	0.017	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Social comparison	-0.03	-0.29	-0.36	0.009	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Avoidant	Social comparison	-0.3	-0.29	0.34	0.09	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Social comparison	-0.25	-0.29	0.35	0.07	4
Joeng et al. (2017) South Corea	473	Mixed	Non clinical	Adult	Avoidant	Self-compasion	-0.3	-0.49	0.37	0.15	5
Joeng et al. (2017) South Corea	473	Mixed	Non clinical	Adult	Anxious	Self-compasion	-0.24	-0.49	0.25	0.12	5
Kamkar et al. (2012) Canada	140	Mixed	Non clinical	Chi/Ado	Anxious	Dysfuntional attitudes	0.3	0.41	0.33	0.12	5
Kamkar et al. (2012) Canada	87	Female	Non clinical	Chi/Ado	Anxious	Low self-esteem	-0.29	-0.55	0.33	0.16	5
Kang et al. (2014) UK	254	Female	Non clinical	Adult	Other	Low self-esteem	-0.24	-0.6	0.15	0.14	5
Kang et al. (2014) UK	254	Female	Non clinical	Adult	Other	Low self-esteem	-0.34	-0.55	0.31	0.19	5
Keleher et al. (2010) US	163	Female	Non clinical	Adult	Anxious	Perceived social support	-0.37	-0.41	0.4	0.15	5
Keleher et al. (2010) US	163	Female	Non clinical	Adult	Avoidant	Perceived social support	-0.1	-0.41	0.29	0.04	5
Kenney (2006) US Tesis	2625	Female	Non clinical	Chi/Ado	Other	Low self-esteem	0.4	-0.51	-0.32	-0.2	5
Kenney (2006) US Tesis	2625	Female	Non clinical	Chi/Ado	Other	Low self-esteem	0.39	-0.51	-0.32	-0.2	5
Kenney (2006) US Tesis	2440	Male	Non clinical	Chi/Ado	Other	Low self-esteem	0.37	-0.5	-0.24	-0.19	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Kenney (2006) US Tesis	2440	Male	Non clinical	Chi/Ado	Other	Low self-esteem	0.39	-0.5	-0.31	-0.2	5
Kenny & Sirin (2006) US	81	Mixed	Non clinical	Adult	Other	Low self-esteem	0.46	-0.48	-0.34	-0.22	5
Kenny et al. (1993) US	92	Female	Non clinical	Chi/Ado	Other	Low self-esteem	0.49	-0.77	-0.47	-0.37	5
Kenny et al. (1993) US	115	Male	Non clinical	Chi/Ado	Other	Low self-esteem	0.64	-0.73	-0.62	-0.47	5
Korolly (2017) US Tesis	157	Mixed	Non clinical	Adult	Anxious	Dependence	0.01	-0.05	0.49	0.000	6
Korolly (2017) US Tesis	155	Mixed	Non clinical	Adult	Anxious	Dependence	0.16	0.24	0.50	0.039	6
Korolly (2017) US Tesis	67	Mixed	Non clinical	Adult	Anxious	Dependence	0.36	-0.31	0.54	-0.112	6
Kullik & Petermann (2013) Germany	127	Female	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	-0.22	0.14	-0.27	-0.03	6
Kullik & Petermann (2013) Germany	127	Female	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	-0.13	0.14	-0.31	-0.02	6
Kullik & Petermann (2013) Germany	121	Male	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	-0.29	0.25	-0.33	-0.07	6
Kullik & Petermann (2013) Germany	127	Female	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.26	0.41	-0.27	-0.1	6
Kullik & Petermann (2013) Germany	127	Female	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.25	0.41	-0.31	-0.1	6
Kullik & Petermann (2013) Germany	121	Male	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.24	0.36	-0.33	-0.08	6
Land (2012) US Tesis	120	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.37	0.63	0.33	0.23	4
Land (2012) US Tesis	120	Mixed	Non clinical	Adult	Anxious	Repetitive thinking	0.37	0.63	0.33	0.23	4
Land (2012) US Tesis	120	Mixed	Non clinical	Adult	Anxious	Brooding rumination	0.37	0.63	0.33	0.23	4
Leal (2018) Mexico Tesis	235	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.18	-0.22	0.36	0.04	5
Leal (2018) Mexico Tesis	235	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.17	-0.22	0.28	0.04	5
Leal (2018) Mexico Tesis	360	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.21	-0.09	0.38	0.02	5
Leal (2018) Mexico Tesis	360	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.32	-0.09	0.23	0.03	5
Lecompte et al. (2014) Canada	68	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	-0.55	-0.51	0.55	0.28	6
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Anxious	Low self-esteem	0.46	-0.57	0.46	-0.26	8
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Avoidant	Low self-esteem	-0.38	-0.57	0.42	0.22	8
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Anxious	Dysfuntional attitudes	0.31	0.23	0.12	0.07	8
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Avoidant	Dysfuntional attitudes	0.32	0.23	0.15	0.07	8
Lee & Koo (2015) Korea	176	Mixed	Non clinical	Adult	Other	Low self-esteem	-0.37	-0.58	0.32	0.21	5
Lee & Koo (2015) Korea	176	Mixed	Non clinical	Adult	Other	Low self-esteem	-0.41	-0.58	0.35	0.24	5
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.28	-0.06	-0.1	-0.02	6
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.2	-0.06	-0.11	-0.01	6
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.28	-0.06	-0.1	-0.02	6

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.2	-0.06	-0.11	-0.01	6
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.22	-0.05	-0.07	-0.01	6
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.19	-0.05	-0.06	-0.01	6
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.22	-0.05	-0.07	-0.01	6
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.19	-0.05	-0.06	-0.01	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.19	-0.03	-0.06	-0.006	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.23	-0.03	-0.19	-0.007	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.19	-0.03	-0.06	-0.006	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.23	-0.03	-0.19	-0.007	6
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.01	0.11	-0.23	-0.002	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.04	0.11	-0.04	-0.02	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.34	0.11	-0.44	-0.04	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.04	0.11	-0.09	-0.006	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.22	0.32	-0.23	-0.07	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.02	0.32	-0.04	-0.009	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.2	0.32	-0.44	-0.06	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.04	0.32	-0.09	0.01	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.01	0.11	-0.23	-0.002	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.04	0.11	-0.04	-0.02	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.34	0.11	-0.44	-0.04	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.04	0.11	-0.09	-0.006	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.22	0.32	-0.23	-0.07	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.02	0.32	-0.04	-0.009	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.2	0.32	-0.44	-0.06	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.04	0.32	-0.09	0.01	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Brooding rumination	-0.01	0.11	-0.23	-0.002	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Brooding rumination	-0.04	0.11	-0.04	-0.02	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Brooding rumination	-0.34	0.11	-0.44	-0.04	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Brooding rumination	-0.04	0.11	-0.09	-0.006	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.22	0.32	-0.23	-0.07	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.02	0.32	-0.04	-0.009	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.2	0.32	-0.44	-0.06	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.04	0.32	-0.09	0.01	5
Liu (2006) Taiwan	522	Female	Non clinical	Chi/Ado	Other	Perceived social support	-0.12	0.18	-0.19	-0.02	5
Liu (2006) Taiwan	522	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.12	-0.36	0.19	-0.04	5
Liu (2006) Taiwan	522	Female	Non clinical	Chi/Ado	Other	Perceived social support	-0.11	0.18	0.19	-0.02	5
Liu (2006) Taiwan	622	Male	Non clinical	Chi/Ado	Other	Perceived social support	-0.14	0.12	0.19	-0.02	5
Liu (2006) Taiwan	622	Male	Non clinical	Chi/Ado	Other	Perceived social support	-0.09	0.12	0.19	-0.01	5
Liu (2006) Taiwan	622	Male	Non clinical	Chi/Ado	Other	Perceived social support	-0.1	-0.39	0.19	0.04	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	-0.34	-0.36	0.14	0.12	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	-0.51	-0.36	0.38	0.18	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Avoidant	Coping: deactivating strategies	-0.34	-0.42	0.14	0.14	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Anxious	Coping: deactivating strategies	-0.2	-0.42	0.38	0.08	5
Love & Murdock (2012) US	167	Mixed	Non clinical	Adult	Other	Low self-esteem	0.38	-0.47	-0.27	-0.18	5
Marganska et al. (2013) US	284	Mixed	Non clinical	Adult	Other	Emotional dysregulation	-0.19	0.42	-0.27	-0.08	5
Marganska et al. (2013) US	284	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.35	0.42	0.31	0.15	5
Marganska et al. (2013) US	284	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.25	0.42	0.25	0.11	5
Marganska et al. (2013) US	284	Mixed	Non clinical	Adult	Other	Emotional dysregulation	-0.03	0.42	0.1	-0.01	5
Margolese et al. (2005) Canada	88	Female	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.25	0.56	-0.27	-0.14	5
Margolese et al. (2005) Canada	88	Female	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.24	0.56	-0.28	-0.13	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.36	0.25	-0.27	-0.09	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	0.09	0.25	0.15	0.02	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.32	0.19	-0.27	-0.06	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.28	0.19	0.15	0.05	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.32	0.19	-0.27	-0.06	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	0.28	0.19	0.15	0.05	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Rumination	-0.32	0.19	-0.27	-0.06	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Rumination	0.28	0.19	0.15	0.05	5
Martin (2001) US Tesis	112	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	1.00	0.50	0.90	0.50	6
Martin (2001) US Tesis	112	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	0.40	0.50	0.30	0.20	6
Martin (2001) US Tesis	112	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	0.20	0.50	0.20	0.10	6

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Anxious	Coping: behavioral hyperactivating strategies	-0.13	-0.21	0.6	0.0273	5
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: behavioral hyperactivating strategies	-0.31	-0.21	0.54	0.0651	5
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Anxious	Coping: behavioral hyperactivating strategies	-0.39	-0.43	0.6	0.1677	5
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: behavioral hyperactivating strategies	-0.64	-0.43	0.54	0.2752	5
Mohammadkhani et al. (2018) Iran	175	Mixed	Non clinical	Adult	Other	Coping: cognitive hyperactivating strategies	0.35	0.50	0.43	0.18	3
Mohammadkhani et al. (2018) Iran	175	Mixed	Non clinical	Adult	Other	Repetitive thinking	0.35	0.50	0.43	0.18	3
Mohammadkhani et al. (2018) Iran	175	Mixed	Non clinical	Adult	Other	Brooding rumination	0.35	0.50	0.43	0.18	3
Monti & Rudolph (2014) US	417	Female	Non clinical	Adult	Anxious	Alexithimia	0	-0.28	0.1	0	7
Monti & Rudolph (2014) US	417	Female	Non clinical	Adult	Avoidant	Alexithimia	-0.25	-0.28	0.01	0.07	7
Owens et al. (2018) US	336	Mixed	Non clinical	Adult	Avoidant	Alexithimia	0.28	0.21	0.21	0.06	6
Owens et al. (2018)/US	336	Mixed	Non clinical	Adult	Anxious	Emotional dysregulation	0.33	0.67	0.46	0.22	6
Owens et al. (2018)/US	336	Mixed	Non clinical	Adult	Avoidant	Emotional dysregulation	0.18	0.72	0.21	0.13	6
Paech et al. (2015) Germany	343	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.31	-0.17	0.27	0.05	5
Paech et al. (2015) Germany	343	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.51	-0.17	0.03	0.09	5
Paech et al. (2015) Germany	343	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.39	-0.46	0.4	0.18	5
Paech et al. (2015) Germany	343	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.24	-0.46	0.05	0.11	5
Permuy et al. (2010) Spain	164	Mixed	Non clinical	Adult	Other	Self-criticism	0.45	0.2	0.28	0.09	4
Permuy et al. (2010) Spain	164	Mixed	Non clinical	Adult	Other	Dependence	0.48	0.27	0.25	0.13	4
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	-0.27	0.66	-0.26	-0.18	5
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.35	0.66	0.37	0.23	5
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	-0.19	0.66	-0.13	-0.13	5
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.48	0.66	0.42	0.32	5
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.23	0.41	-0.6	-0.1	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.29	0.41	-0.45	-0.11	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.37	0.41	-0.42	-0.15	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Social comparison	0.26	-0.37	-0.3	-0.1	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Avoidant	Social comparison	-0.11	-0.37	0.19	0.04	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Social comparison	-0.28	-0.37	0.38	0.1	4
Reinecke & Rogers (2001) US	54	Mixed	Clinical	Adult	Other	Dysfuntional attitudes	0.71	0.28	0.41	0.20	5
Reis & Grenyer (2002) Australia	245	Mixed	Non clinical	Adult	Other	Maladaptative perfectionism	0.27	0.29	0.34	0.08	5
Reis & Grenyer (2002) Australia	245	Mixed	Non clinical	Adult	Other	Maladaptative perfectionism	0.17	0.33	0.53	0.06	5
Reis & Grenyer (2002) Australia	245	Mixed	Non clinical	Adult	Other	Maladaptative perfectionism	0.44	0.49	0.53	0.22	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Anxious	Dysfuntional attitudes	0.21	0.35	0.22	0.07	4
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	-0.14	0.35	-0.22	-0.05	4
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Anxious	Low self-esteem	-0.36	-0.49	0.22	0.18	4
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Other	Low self-esteem	0.3	-0.49	-0.22	-0.15	4
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Self-criticism	0.39	0.57	0.36	0.22	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Self-criticism	0.19	0.57	0.36	0.11	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Self-criticism	0.38	0.57	0.36	0.22	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Self-criticism	0.31	0.57	0.36	0.18	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Self-compasion	-0.38	-0.53	0.36	0.2	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Self-compasion	-0.26	-0.53	0.36	0.14	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.32	0.43	0.36	0.14	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.6	0.43	0.36	0.26	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Repetitive thinking	0.32	0.43	0.36	0.14	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Repetitive thinking	0.6	0.43	0.36	0.26	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Brooding rumination	0.32	0.43	0.36	0.14	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Brooding rumination	0.6	0.43	0.36	0.26	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.19	0.49	-0.36	-0.1	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.41	0.49	0.33	0.2	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.16	0.49	0.15	0.08	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	0.16	0.49	0.15	0.08	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.19	0.49	-0.36	-0.1	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	0.41	0.49	0.33	0.2	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Rumination	-0.19	0.49	-0.36	-0.1	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Rumination	0.41	0.49	0.33	0.2	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Rumination	0.16	0.49	0.15	0.08	6
Safford et al. (2004) US	167	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	-0.2	0.29	-0.49	-0.06	5
Şenkal & Işikli (2015) Turkey	417	Mixed	Non clinical	Adult	Anxious	Alexithimia	0.33	0.29	0.34	0.1	5
Shaver et al. (2005) US	61	Female	Non clinical	Adult	Anxious	Relational satisfaction	-0.21	-0.11	0.67	0.02	4
Shaver et al. (2005) US	61	Male	Non clinical	Adult	Anxious	Relational satisfaction	-0.18	-0.18	0.31	0.03	4
Silverman (2003) Canada Tesis	451	Mixed	Non clinical	Chi/Ado	Other	Perceived social support	-0.59	-0.53	0.49	0.31	7
Smagur (2018) US Tesis	301	Female	Non clinical	Adult	Other	Dysfuntional attitudes	0.48	0.39	0.58	0.19	7
Suzuki & Tomoda (2015) Japan	342	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	0.3	-0.49	-0.32	-0.15	7
Suzuki & Tomoda (2015) Japan	342	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	-0.47	-0.49	0.4	0.23	7
Suzuki & Tomoda (2015) Japan	342	Mixed	Non clinical	Chi/Ado	Avoidant	Low self-esteem	-0.13	-0.49	0.23	0.06	7

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Vahedi et al. (2016) Iran	285	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	-0.13	-0.21	0.31	0.03	5
Vahedi et al. (2016) Iran	285	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.35	0.42	0.25	0.15	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adult	Other	Self-compasion	-0.49	-0.33	0.48	0.16	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adult	Other	Coping: cognitive hyperactivating strategies	-0.44	-0.10	0.48	0.04	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adult	Other	Self-control	-0.44	-0.10	0.48	0.04	5
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Anxious	Coping: cognitive hyperactivating strategies	0.31	0.52	0.35	0.16	7
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: cognitive hyperactivating strategies	0.01	0.52	0.26	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Coping: cognitive hyperactivating strategies	0.22	0.39	0.48	0.09	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: cognitive hyperactivating strategies	0.02	0.39	0.18	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Coping: cognitive hyperactivating strategies	0.25	0.44	0.48	0.11	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: cognitive hyperactivating strategies	0.03	0.44	0.18	0.01	7
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Anxious	Repetitive thinking	0.31	0.52	0.35	0.16	7
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Avoidant	Repetitive thinking	0.01	0.52	0.26	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Repetitive thinking	0.22	0.39	0.48	0.09	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Repetitive thinking	0.02	0.39	0.18	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Repetitive thinking	0.25	0.44	0.48	0.11	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Repetitive thinking	0.03	0.44	0.18	0.01	7
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.33	-0.33	-0.7	-0.11	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.5	-0.63	-0.7	-0.32	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.33	-0.38	-0.7	-0.16	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.33	-0.33	-0.58	-0.11	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.53	-0.63	-0.58	-0.33	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.27	-0.38	-0.58	-0.1	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.05	-0.07	-0.35	-0.003	3

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.12	-0.46	-0.35	-0.06	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.08	-0.36	-0.35	-0.03	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.14	-0.07	-0.27	-0.009	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.28	-0.46	-0.27	-0.12	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.08	-0.36	-0.27	-0.03	3
Wei (2006) US	372	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	-0.05	0.32	0.69	-0.016	7
Wei (2006) US	372	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	-0.03	0.32	0.69	-0.0096	7
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Anxious	Coping: behavioral hyperactivating strategies	0.25	0.29	0.29	0.07	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Avoidant	Coping: behavioral hyperactivating strategies	0.18	0.29	0.32	0.05	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.42	0.4	0.29	0.17	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.26	0.4	0.32	0.1	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Anxious	Coping: deactivating strategies	0.33	0.44	0.29	0.15	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Avoidant	Coping: deactivating strategies	0.32	0.44	0.32	0.14	5
Wei et al. (2004) US	310	Mixed	Non clinical	Adult	Anxious	Maladaptative perfectionism	0.49	0.58	0.49	0.28	5
Wei et al. (2004) US	310	Mixed	Non clinical	Adult	Avoidant	Maladaptative perfectionism	0.28	0.58	0.18	0.16	5
Wei et al. (2005) US	308	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.37	-0.27	0.26	0.1	5
Wei et al. (2005) US	308	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.21	-0.27	0.1	0.06	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adult	Anxious	Dependence	-0.52	-0.68	0.56	0.35	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adult	Avoidant	Dependence	-0.36	-0.68	0.31	0.24	5
Wei et al. (2005c) US	308	Mixed	Non clinical	Adult	Anxious	Self disclosure	-0.16	-0.27	0.26	0.04	5
Wei et al. (2005c) US	308	Mixed	Non clinical	Adult	Avoidant	Self disclosure	-0.4	-0.27	0.1	0.11	5
Wei et al. (2006) US	372	Mixed	Non clinical	Adult	Anxious	Maladaptative perfectionism	0.11	0.23	0.43	0.03	7
Wei et al. (2006) US	372	Mixed	Non clinical	Adult	Avoidant	Maladaptative perfectionism	0.13	0.23	0.11	0.03	7
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Anxious	Low self-esteem	-0.38	-0.66	0.4	0.25	5
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Avoidant	Low self-esteem	-0.28	-0.66	0.2	0.18	5
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	0.03	-0.03	0.4	-0.001	5
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	0.06	-0.03	0.2	-0.002	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental Stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Wijngaardsde et al. (2007) Neetherland	438	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.33	-0.26	0.31	0.09	6
Wijngaardsde et al. (2007) Neetherland	438	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.12	-0.26	0.33	0.03	6
Williams et al. (2004) US	291	Mixed	Non clinical	Adult	Anxious	Dysfuntional attitudes	0.26	0.35	0.46	0.1	3
Ying et al. (2007) US	122	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.09	-0.68	-0.08	-0.0612	6
Ying et al. (2007) US	122	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.27	-0.68	-0.2	-0.1836	6
Ying et al. (2007) US	121	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.39	-0.56	-0.29	-0.2184	6
Ying et al. (2007) US	121	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.3	-0.56	-0.19	-0.168	6
Ying et al. (2007) US	110	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.24	-0.63	-0.22	-0.1512	6
Ying et al. (2007) US	110	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.23	-0.63	-0.12	-0.1449	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.67	0.05	0.42	-0.0335	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.16	0.05	0.22	-0.008	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Anxious	Relational conflict	0.15	0.17	0.42	0.0255	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Avoidant	Relational conflict	0.39	0.17	0.22	0.0663	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.32	0.09	0.4	-0.0288	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.1	0.09	0.22	-0.009	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Anxious	Relational conflict	0.18	0.13	0.4	0.0234	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Avoidant	Relational conflict	0.13	0.13	0.22	0.0169	6
Zhu et al. (2016) China	363	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.13	-0.22	0.29	0.03	6
Zhu et al. (2016) China	363	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.13	-0.22	0.02	0.03	6
Zhu et al. (2016) China & US	726	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.25	-0.203	0.33	0.05	6
Zhu et al. (2016) China & US	726	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.33	-0.23	0.18	0.07	6
Zhu et al. (2016) US	363	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.2	-0.11	0.32	0.02	6
Zhu et al. (2016) US	363	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.25	-0.11	0.23	0.03	6

Note. Chi/Ado = Children and/or Chi/Ado; IV = Independent Variable, Other = Other type of insecure attachment; Path *a* = association between independent variable and mediator; Path *b* = association between mediator and dependent variable; Path *c* = total effect of the independent variable on the dependet variable; *a*b* = the indirect effect of the independent variable on the dependent variable controlling the mediator.

Supplementary Table 3

Detailed extracted and coded data of studies with additional mediators

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Aderka et al. (2009) Israel	102	Mixed	Non clinical	Adults	Other	Social anxiety severity	0.39	0.20	0.38	0.08	5
Bishop et al. (2018) US	251	Mixed	Non clinical	Adults	Anxious	Role balance	-0.36	-0.38	0.36	0.14	6
Bozanoglu et al. (2017) Turkey	374	Mixed	Non clinical	Chi/Ado	Other	Gap between experience and language	-0.66	0.2	-0.54	-0.13	5
Burnette et al. (2009) US	221	Mixed	Non clinical	Adults	Avoidant	Empathy (lack)	-0.31	-0.10	0.25	0.03	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adults	Avoidant	Forgivigness	-0.16	-0.44	0.25	0.07	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adults	Anxious	Forgivigness	-0.40	-0.44	0.52	0.18	3
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Vindictive	0.36	0.26	0.52	0.09	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Vindictive	0.28	0.26	0.37	0.07	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Cold	0.24	0.32	0.52	0.08	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Cold	0.56	0.32	0.37	0.18	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Socially Avoidant	0.32	0.36	0.52	0.12	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Socially Avoidant	0.34	0.36	0.37	0.12	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Nonassertive	0.31	0.28	0.52	0.09	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Nonassertive	0.19	0.28	0.37	0.05	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Exploitable	0.31	0.41	0.52	0.13	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Exploitable	0.22	0.41	0.37	0.09	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Overly Nurturant	0.42	0.53	0.52	0.22	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Overly Nurturant	0.16	0.53	0.37	0.08	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Intrusive	0.24	0.18	0.52	0.04	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Intrusive	-0.27	0.18	0.37	-0.05	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Domineering	0.24	0.23	0.52	0.06	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Domineering	0.06	0.23	0.37	0.01	5
Felton & Jowett (2015) UK	241	Mixed	Non clinical	Adults	Avoidant	Need of thwarting sport	0.22	0.26	0.12	0.06	5
Felton & Jowett (2015) UK	241	Mixed	Non clinical	Adults	Anxious	Need of thwarting sport	0.32	0.26	0.11	0.08	5
Farinelli & Guerrero (2011) US	195	Mixed	Non clinical	Adults	Anxious	Overinvolved caregiving	0.22	0.19	0.23	0.04	4
Farinelli & Guerrero (2011) US	195	Mixed	Non clinical	Adults	Avoidant	Overinvolved caregiving	0.19	0.19	0.22	0.04	4
Gülum & Dag (2013) Turkey	661	Female	Non clinical	Adults	Anxiety	Locus of Control	0.27	0.29	0.38	0.08	3
Gülum & Dag (2013) Turkey	331	Male	Non clinical	Adults	Anxiety	Locus of Control	0.32	0.23	0.34	0.07	3
Gülum & Dag (2013) Turkey	661	Female	Non clinical	Adults	Avoidant	Locus of Control	0.12	0.29	0.09	0.03	3
Gülum & Dag (2013) Turkey	331	Male	Non clinical	Adults	Avoidant	Locus of Control	0.16	0.23	0.14	0.04	3
Halpern et al. (2012) Canada	189	Mixed	Non clinical	Adults	Avoidant	Recovery from social withdrawal	0.36	0.28	0.43	0.1	2
Halpern et al. (2012) Canada	189	Mixed	Non clinical	Adults	Avoidant	Recovery from physical arousal	0.29	0.34	0.43	0.1	2
Hopkins et al. (2019) US	796	Mixed	Non clinical	Children	Other	Effortful Control	0.33	-0.23	-0.14	-0.08	9
Joeng et al. (2017) South Corea	473	Mixed	Non clinical	Adults	Avoidant	Fear of self compassion	0.46	0.45	0.5	0.21	5
Joeng et al. (2017) South Corea	473	Mixed	Non clinical	Adults	Anxious	Fear of self compassion	0.34	0.45	0.4	0.15	5
Keleher et al. (2010) US	163	Female	Non clinical	Adults	Anxious	Positive feelings about being a Lesbian	-0.2	-0.7	0.4	0.14	5
Keleher et al. (2010) US	163	Female	Non clinical	Adults	Avoidant	Positive feelings about being a Lesbian	-0.28	-0.7	0.29	0.2	5
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Observe	-0.08	0.11	-1.28	-0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Observe	0.33	0.13	0.07	0.04	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Observe	0.38	0.1	1.22	0.04	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Describe	0.93	0.05	-1.28	0.05	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Describe	0.03	0.02	0.07	0.001	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Describe	-0.5	0.03	1.22	-0.02	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Act with awareness	0.25	0.03	-1.28	0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Act with awareness	-0.05	0.05	0.07	-0.003	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Act with awareness	-0.28	0.034	1.22	-0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	No judgement	0.65	-0.15	-1.28	-0.1	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	No judgement	0.25	-0.16	0.07	-0.1	6

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	No judgement	-1	-0.13	1.22	0.13	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	No reactivity	0.25	0.02	-1.28	0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	No reactivity	0.28	-0.56	0.07	-0.16	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	No reactivity	-0.21	0.03	1.22	-0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Decentering	0.84	-0.5	-1.28	-0.42	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Decentering	0.46	0.03	0.07	0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Decentering	-0.76	-0.5	1.22	0.38	6
Love & Murdock (2012) US	167	Mixed	Non clinical	Adults	Other	Trustworthiness	0.15	-0.19	-0.27	-0.03	5
Marchand-Reilly (2009) US	110	Mixed	Non clinical	Adults	Other	Attacking conflict behaviours	-0.34	0.2	-0.46	-0.07	4
Marchand-Reilly (2009) US	110	Mixed	Non clinical	Adults	Other	Attacking conflict behaviours	-0.24	0.22	-0.51	-0.05	4
Marchand-Reilly (2009) US	110	Mixed	Non clinical	Adults	Anxious	Attacking conflict behaviours	0.3	0.18	0.56	0.05	4
Marks et al. (2016) Australia	343	Mixed	Non clinical	Adults	Anxious	Emotional intelligence	-0.31	-0.43	0.43	0.13	5
Marks et al. (2016) Australia	343	Mixed	Non clinical	Adults	Avoidant	Emotional intelligence	-0.4	-0.43	0.26	0.17	5
Martin (2008) US Tesis	174	Male	Non clinical	Adults	Other	Complicated Grief (CG)	-0.06	0.26	-0.04	-0.02	5
Martin (2008) US Tesis	174	Male	Non clinical	Adults	Anxious	Complicated Grief (CG)	0.16	0.26	0.03	0.04	5
Martin (2008) US Tesis	174	Male	Non clinical	Adults	Avoidant	Complicated Grief (CG)	0.05	0.26	0.04	0.01	5
McDermott et al. (2015) US	2644	Mixed	Non clinical	Adults	Anxious	Hope	-0.27	-0.57	0.48	0.15	6
McDermott et al. (2015) US	2644	Mixed	Non clinical	Adults	Avoidant	Hope	-0.18	-0.57	0.34	0.1	6
Mendes (2019) Portugal	91	Female	Non clinical	Adults	Other	Social safeness	-0.5	-0.49	-0.32	0.245	3
Milne & Greenway (2007) Australia	52	Female	Non clinical	Chi/Ado	Other	Separation-individuation process	-0.58	0.47	-0.7	-0.27	3
Milne & Greenway (2007) Australia	52	Female	Non clinical	Chi/Ado	Other	Introjective depression	-0.49	0.27	-0.71	-0.13	3
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Anxious	Contentment-Duration	-0.25	-0.14	0.27	0.04	5
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Avoidant	Contentment-Duration	0	-0.14	0.08	0	5
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Anxious	Contentment-Intensity	0.1	0.09	0.27	0.01	5
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Avoidant	Contentment-Intensity	-0.05	0.09	0.08	-0.005	5
Nichols (2005) UK Tesis	147	Mixed	Non clinical	Adults	Anxious	Involuntary defeat strategy	0.19	0.76	0.17	0.14	5
Nichols (2005) UK Tesis	147	Mixed	Non clinical	Adults	Avoidant	Involuntary defeat strategy	0.22	0.76	0.2	0.17	5
Riggs et al. (2009) US	317	Mixed	Non clinical	Adults	Anxious	Chronic anxiety	0.2	0.76	0.52	0.15	6

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Mistrust/Maladaptive schemas	-0.56	0.53	-0.58	-0.3	5
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Social isolation/ Maladaptive Schemas	-0.48	0.57	-0.58	-0.27	5
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Social isolation/Maladaptive Schemas	0.53	0.57	0.48	0.3	5
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Self-sacrifice/Maladaptive Schemas	0.31	0.33	0.48	0.1	5
Rosenthal et al. (2014) UK Tesis	104	Mixed	Non clinical	Adults	Anxious	Group identification	-0.19	-0.25	0.52	0.05	6
Rosenthal et al. (2014) UK	104	Mixed	Non clinical	Adults	Avoidant	Group identification	-0.23	-0.29	0.3	0.07	6
Shochet et al. (2008) Australia	153	Mixed	Non clinical	Chi/Ado	Other	School connectedness	0.47	-0.58	-0.53	-0.27	5
Smojver-Azic et al. (2015) Croatia	219	Mixed	Non clinical	Chi/Ado	Anxious	Emotional adjustment	-0.47	-0.29	0.3	0.14	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	Anxious	Agency	-0.23	-0.22	0.45	0.05	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	Avoidant	Agency	0	-0.22	0.21	0	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	anxious	Nurturance	0.22	-0.02	0.4	-0.004	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	Avoidant	Nurturance	-0.46	-0.02	0.22	0.01	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Positive affect	-0.06	-0.02	0.47	0.001	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Positive affect	-0.17	-0.02	0.3	0.003	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Negative affect	0.01	0.1	0.47	0.001	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Negative affect	0.11	0.1	0.3	0.011	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Coherence	-0.16	-0.21	0.47	0.03	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Coherence	-0.34	-0.21	0.3	0.07	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Emotional intensity	-0.06	-0.16	0.47	0.01	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Emotional intensity	-0.32	-0.16	0.3	0.05	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Positive affect	-0.09	-0.03	0.44	0.003	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Positive affect	-0.12	-0.03	0.26	0.004	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Negative affect	0.2	0.18	0.44	0.036	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Negative affect	0.1	0.18	0.26	0.018	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Coherence	-0.09	-0.27	0.44	0.024	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Coherence	-0.25	-0.27	0.26	0.07	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Emotional intensity	0.12	0.01	0.44	0.001	5

Author/s (Year) Country	Sample	Gender	Clinical vs Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Emotional intensity	-0.19	0.01	0.26	-0.002	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adults	Other	Self-Knowledge	-0.60	-0.20	0.48	0.12	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adults	Other	Mindfulness	-0.47	-0.01	0.48	0.01	5
Wang (2007) China Tesis	480	Mixed	Non clinical	Chi/Ado	Avoidant	Filial piety: concerned about parents or elderly (reciprocral)	-0.58	-0.08	0.05	0.05	6
Wang (2007) China Tesis	480	Mixed	Non clinical	Chi/Ado	Anxiety	Filial piety:live with parent or parent in law after marriage (autoritarian)	0.15	0.04	0.14	0.01	6
Wei et al. (2005c) US	308	Mixed	Non clinical	Adults	Anxious	Loneliness	0.55	0.59	0.26	0.3245	5
Wei et al. (2005c) US	308	Mixed	Non clinical	Adults	Avoidant	Loneliness	0.35	0.59	0.01	0.2065	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adults	Anxious	Self-reinforcement	0.62	0.6	0.56	0.37	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adults	Avoidant	Self-reinforcement	0.21	0.6	0.31	0.13	5
Wei et al. (2005a) US	299	Mixed	Non clinical	Adults	Anxious	Basic Psychological Needs Satisfaction	-0.43	-0.64	0.64	0.28	7
Wei et al. (2005a) US	299	Mixed	Non clinical	Adults	Avoidant	Basic Psychological Needs Satisfaction	-0.32	-0.64	0.3	0.2	7
Wei et al. (2007) US	390	Mixed	Non clinical	Adults	Anxious	Self-defeating patterns	0.38	0.22	0.4	0.08	5
Wei et al. (2007) US	390	Mixed	Non clinical	Adults	Avoidant	Self-defeating patterns	0.39	0.22	0.2	0.09	5
Zakalik & Wei (2006) US	234	Male	Non clinical	Adults	Anxious	Perceived discrimination	0.5	0.23	0.63	0.12	6
Zakalik & Wei (2006) US	234	Male	Non clinical	Adults	Avoidant	Perceived discrimination	-0.15	0.23	0.32	-0.03	6

Note. Chi/Ado = Children and/or adolescents; IV = Independent Variable, Other = Other type of insecure attachment; Path *a* = association between independent variable and mediator; Path *b* = association between mediator and dependent variable; Path *c* = total effect of the independent variable on the dependet variable; *a*b* = the indirect effect of the independent variable on the dependent variable controlling the mediator.

Mediating role of depressive symptoms linking insecure attachment and disordered eating in adolescents: A multi-wave longitudinal study

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Keyword:	Adolescents, Depressive Symptoms, Disordered Eating, Dynamic Panel Model, Insecure Attachment
Abstract:	Research has supported a link between insecure attachment and disordered eating in adolescents; however, how this influence is exerted remains unclear. This study explored whether depressive symptoms constitute a pathway through which insecure attachment to the mother predicts subsequent development of disordered eating in the transition from childhood to adolescence, and whether there is a differential effect between genders. A community-based sample of Spanish youth (n = 904; 49.4% girls) was followed biennially from age 10 to 16. Attachment, depressive symptoms and disordered eating were measured using the Inventory of Parental and Peer Attachment, Children's Depression Inventory and Children's Eating Attitudes Test, respectively. Prospective data were analyzed using a dynamic panel model, which accounts for unmeasured time-invariant factors. Overall, higher secure attachment to the mother at age 10 and 12 predicted less disordered eating at ages 14 and 16 via less depressive symptoms at ages 12 and 14. This study suggests that an increase in depressive symptoms might be one mechanism by which insecure attachment exerts its influence on the development of eating disorders symptomatology in adolescence. Interventions efforts aimed at strengthening the mother–child attachment relationship may reduce the vulnerability to develop depressive and eating symptoms.

Abstract

Research has supported a link between insecure attachment and disordered eating in adolescents; however, how this influence is exerted remains unclear. This study explored whether depressive symptoms constitute a pathway through which insecure attachment to parents predicts subsequent development of disordered eating in the transition from childhood to adolescence. Also, whether there are differential effects regarding the attachment figure, child's gender or reciprocity between variables. A community-based sample of Spanish youth (n = 904; 49.4% girls) was followed biennially from age 10 to 16. Attachment, depressive symptoms and disordered eating were measured using the Inventory of Parental and Peer Attachment, Children's Depression Inventory and Children's Eating Attitudes Test, respectively. Prospective data were analyzed using a dynamic panel model, which accounts for unmeasured time-invariant factors. Whereas insecure attachment to the father did not predict later depression or disordered eating, higher insecure attachment to the mother at age 10 and 12 predicted more disordered eating at ages 14 and 16 via increased depressive symptoms at ages 12 and 14. No child's gender-specific or reverse mediational effects were found.This study suggests that an increase in depressive symptoms might be one mechanism by which insecure attachment exerts its influence on the development of eating disorders symptomatology in adolescence. Interventions efforts aimed at strengthening particularly the mother–child attachment relationship may reduce the vulnerability to develop depressive symptoms and disordered eating.

Keywords: Adolescents, Insecure Attachment, Depressive Symptoms, Disordered Eating, Dynamic Panel Model

Adolescence is a developmental period characterized by significant biological, psychological and social changes (e.g., Cicchetti & Toth, 2009). These complex metamorphoses, which occur more or less simultaneously, provide a developmental context of risk for the emergence of mental health problems, especially in young people with a committed capacity to cope with the many challenges of adolescence (Casey et al., 2010; Kessler et al., 2005).

Research documents striking increases in several forms of psychopathology early in adolescence, including eating disorders (EDs) (e.g., Smink, van Hoeken, & Hoek, 2012) and depression (e.g., Hankin et al., 2015). Both disorders have a strong potential to interfere with development, leading to suffering and disability among adolescents (Smink et al., 2012; Thapar, Collishaw, Pine, & Thapar, 2012). In addition to diagnosable conditions, many adolescents experience subthreshold or subclinical forms of EDs (i.e., disordered eating such as frequent dieting, weight and shape concerns, and binge eating and/or fasting, vomiting, and laxative use for weight loss; Ackard, Fulkerson, & Neumark-Sztainer, 2011; Chamay-Weber, Narring, & Michaud, 2005) and depression (Carrellas, Biederman, & Uchida, 2017; Wesselhoeft, Sørensen, Heiervang, & Bilenberg, 2013) with resulting impairment resembling that stemming from full clinical forms. In the presence of sufficient risk factors, this further increases the risk for later EDs (Chamay-Weber et al., 2005; Stice, Marti, Shaw, & Jaconis, 2009) or major depressive disorder (Lewinsohn, Solomon, Seeley, & Zeiss, 2000). While the evidence confirms that adolescence is a particularly sensitive stage for the development of these psychopathologies, little is known about the factors responsible for the emergence and maintenance of their symptoms. Ultimately, such knowledge will inform prevention and intervention efforts.

Several scholars have suggested that insecure attachment can operate as a risk factor for EDs and depression in middle childhood and adolescence (Gander, Sevecke, & Buchheim, 2015;

Jewell et al., 2016; Kerns & Brumariu, 2016; Madigan, Atkinson, Laurin, & Benoit, 2013). One of the main premises of attachment theory is that early caregiving experiences form individuals' representations of themselves and others (Cassidy, 2016). According to Bowlby (1969/1982) such representations subsequently influence the development of other relationships throughout the lifespan. In the context of sensitive and responsive caregiving, children develop secure attachment representations. By contrast, children who have experienced inconsistent and unresponsive caregiving are more likely to develop insecure attachment representations, and, as a consequence, see themselves as unworthy and unlovable and others as unsupportive and unreliable (Bowlby, 1969/1982). When facing distress, these children use emotion regulation strategies such as a tendency to withdraw from important others and restrict emotions (*avoidant attachment*), or to cling to important others and to become overwhelmed by emotions (*anxious attachment*), which both are regulation strategies that increase vulnerability to psychopathology (DeKlyen & Greenberg, 2016; Gentzler, Kerns, & Keener, 2010).

Evidently, insecure attachment may be only one of the many risk factors for the development of disordered eating (e.g., Faber et al., 2018) and depressive symptoms (Malik, Wells, & Wittkowski, 2015; Morley & Moran, 2011). Contemporary attachment researchers have stressed the importance to thoughfully reconsider how and why early insecure attachment could be associated with later development using more incisive methodologies (Thompson, 2016). In particular, *longitudinal mediational models* could help elucidate the mechanisms by which insecure attachment increases the risk of negative developmental outcomes (DeKlyen & Greenberg, 2016). Although researchers studying the link between attachment and depressive symptoms in adolescents have heeded this call (Cohen et al., 2013; Gaylord-Harden et al., 2009;

Lee & Hankin, 2009), no study has tested a longitudinal attachment-based model including putative factors that may mediate the relation between attachment and disordered eating.

The present study aims to shed light on this by investigating a pathway from insecure attachment via depressive symptoms to disordered eating – and vice versa – covering the transition from middle childhood into the presumed decisive early and middle adolescent years, often overlooked (Bosmans & Kerns, 2015). We first review theories and evidence on the impact of insecure attachment on depressive symptoms, then the importance of depressive symptoms for later disordered eating, before turning to theorizing and findings suggesting a mediational pathway from insecure attachment to disordered eating via increased depressive symptoms.

The Relation between Insecure Attachment and Depressive Symptoms

The link between insecure attachment and depression has been broadly demonstrated across life span (Dagan, Facompré, & Bernard, 2018; Stovall-McClough & Dozier, 2016). According to Morley & Moran (2011), negative self-representations rooted in dysfunctional early attachment relationships influence the interpretation and response to future negative events, which is consistent with cognitive theories of vulnerability to depression (Abramson, Seligman, & Teasdale, 1978; Beck, 1987). Thus, it is assumed that the "negative interpretative lens" makes insecurely attached individuals more prone to depression.

Arguably, the sociocognitive biases of self and others may foster particular ways of relating, either in overly distancing and/or demanding ways (Abela & Hankin, 2009), increasing the risk of experiencing real or perceived negative interpersonal relationships (Dagan et al., 2018; Hammen, 2009; Hankin, Kassel, & Abela, 2005). Such negative interpersonal experiences may disturb the acquisition of necessary social skills to thrive in relationships, and rather foster poor emotion regulation strategies (Malik et al., 2015; Rudolph, 2009). This is particularly

detrimental in the transition to adolescence, when youngsters typically expand the scope of their relationships (Allen & Tan, 2016).

Insecurely attached children negative views of self and others may thus be reinforced into adolescence and increase the risk of depressive symptomatology (Brumariu & Kerns, 2010; Duggal, Carlson, Sroufe, & Egeland, 2001). Recent meta-analytic evidence has demonstrated the empirical link between attachment and depression in children and adolescents, with an overall significant moderate effect size (r = .31) (Spruit et al., 2020). Indeed, there is ample prospective evidence demonstrating that insecure attachment predicts increased depressive symptoms over the course of adolescence (Cortés-García, Wichstrøm, Viddal, & Senra, 2019; Margolese, Markiewicz, & Doyle, 2005; Sund & Wichstrøm, 2002)— the first lag in our proposed mediation.

Depressive Symptoms and Disordered Eating

Depressive symptoms and disordered eating co-occur (Puccio, Fuller-Tyszkiewicz, Ong, & Krug, 2016), possibly, to some extent, because poor emotion regulation increase the risk of both (Vögele, Lutz, & Gibson, 2018). Ultimately, emotion dysregulation might be rooted in individuals' early mental representations (Faber et al., 2018; Malik et al., 2015). However, even if depressive symptoms and disordered eating influence each other (Puccio et al., 2016) there is robust evidence that eating serves as a strategy to modify emotional states, particularly to reduce depressive symptoms, because of its immediately rewarding nature as well as its distracting elements (Haedt-Matt & Keel, 2011; Heatherton & Baumeister, 1991). As such, overeating is thought to be instigated in order to dampen negative emotions (Vögele et al., 2018). Similarly, extreme dieting may become rewarding due to social reinforcement originating from weight loss, or, due to a sense of mastery of hunger and weight. These positive effects may alleviate negative

mood, including depressive mood, related to the perception of inefficacy and reduced ability to control one's life (Froreich, Vartanian, Grisham, & Touyz, 2016). Thus, a variety of explanatory models converge in suggesting that negative affect, which is one of the core symptoms of depression, is part of the etiology of EDs (Stice, 2001; Stice et al., 2017). This is buffered by findings from a range of longitudinal studies demonstrating that depressive symptomatology precedes disordered eating in adolescents (Ferreiro, Wichstrøm, Seoane, & Senra, 2014; Ferriter, Eberhart, & Hammen, 2010; Hautala et al., 2011). Accordingly, there is substantial support for the second step of our proposed mediational pathway.

Does Insecure Attachment influence the Development of Disordered Eating via Depressive Symptoms in Adolescence?

Recent reviews have indicated that insecure attachment forecasts disordered eating during the transition to adolescence (Gander et al., 2015; Jewell et al., 2016). This assertion has been demonstrated in long term follow-up studies (Cortés-García, Hoffmann, Warschburger, & Senra, 2019; Le Grange et al., 2014; Milan & Acker, 2014). Even though the insecure attachment—EDs link is established, less is know about processes responsible for the association.

In light of the above evidence, some authors have forwarded the idea that increased depressiveness may be a candidate mechanism by which insecure attachment could put adolescents at risk for (Cortés-García et al., 2019; Jewell et al., 2016) or to maintain symptoms of EDs (Tasca, 2018; Tasca & Balfour, 2014). Thus far, only one cross-sectional study has tested this proposition in adolescents—albeit in a clinical sample (Brochu et al., 2018), finding that negative mood and low self-esteem were mediators in the association between perceived alienation with the mother and more severe symptoms of EDs. However, the reverse influence is

a distinct possibility, hence the role of depression as a mediating mechanism needs to be tested prospectively; a task heretofore not undertaken — but which we will address herein.

Although most empirical studies have emphasized insecure attachment as the *predictor* of psychopathology, reciprocal influences should be taken into account. Indeed, previous studies have revealed a mutual influence between attachment relationships with the mother and depressive symptoms in adolescence (e.g., Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Branje, Hale, Frijns, & Meeus, 2010). Likewise, the negative influence of disordered eating on attachment, particularly to the mother, has been shown by previous research (e.g., Crespo, Kielpikowski, Jose, & Pryor, 2010; Korotana, von Ranson, Wilson, & Iacono, 2018). Conceivably, when facing difficult situations, insecurely attached children may turn excessively to their attachment figures for support (Margolese et al., 2005; Viejo, Monks, Sánchez-Rosa, & Ortega-Ruiz, 2019) and these persistent demands of comfort and reassurance may end up generating disruption in the parent-child attachment relationship (Allen & Tan, 2016). The present study provides the opportunity to identify such potential reverse paths.

The Relative Importance of Attachment to the Mother and the Father for Depressive Symptoms and Disordered Eating

In general, research has underscored the vital role of parents as primary attachment figures even into young adulthood (Brumariu & Kerns, 2010). According to Kerns et al. (2015), during middle childhood and early adolescence, parents tend to adopt complementary roles: mothers represent the *safe haven* when children face threatened situations (providing emotional comfort and reducing distress) and fathers represent the *secure base*, from which to explore (guaranteeing reassurance, and/or assistance if they encounter difficulties). Both functions are significant as children enter adolescence and must coregulate their needs for care and autonomy

(Kerns & Brumariu, 2016). While the literature confirms that the formation of a secure attachment to parents promotes emotion competence, less negative mood and positive self-views (Thompson, 2016), little is known about the differential contribution of insecure attachment to the mother and to the father to the development of disordered eating and depressive symptoms. It should be pointed out that most of the research has either contemplated attachment to the mother exclusively or aggregated mother-child and father-child relationships in attachment measures (Lamb & Lewis, 2011).

As regards depressive symptoms, the majority of prospective studies including both parents have documented the influence of insecure attachment to the mother across adolescence (Agerup, Lydersen, Wallander, & Sund, 2015; Branje et al., 2010; Cortés-García et al., 2019; Duchesne & Ratelle, 2014). The importance of attachment to the father has been less consistently documented. One study found that insecure attachment to the father was associated with increases in depressive symptoms from early to late adolescence only in boys (Branje et al., 2010), another study reported an insecure attachment-depression link only during pre-adolescence after adjusting by gender (Duchesne & Ratelle, 2014). Regarding eating symptoms, mostly prospective studies have suggested that disordered eating is more consistently related to attachment toward the mother than the father (Cortés-García et al., 2019; Goossens, Braet, Van Durme, Decaluwé, & Bosmans, 2012; Korotana et al., 2018). The evidence on attachment to the father is limited and inconclusive. For instance, whereas some studies report an influence of attachment to the father (along with the mother) in early adolescence, in both boys and girls (Goossens et al., 2012), other studies found this influence only in girls (Korotana et al., 2018; Pace, Cacioppo, & Schimmenti, 2012).

Collectively, the evidence suggests that insecure attachment to the mother may be particularly influential in the development of depressive and eating symptoms in adolescence, which may respond to the fact that boys and girls do not find reassurance and comfort in times of distress that they need from their mothers as a *safe haven* (Markiewicz, Lawford, Doyle, & Haggart, 2006; Rosenthal & Kobak, 2010; Viejo et al., 2019). However, the interplay between these factors remains unclear. There is scarce prospective research considering attachment to the father, yielding inconsistent results. Because of some overlap between attachment to the mother and the father (Boldt, Kochanska, Grekin, & Brock, 2016), to detail the effect of attachment to the father, we need to know the contribution of this relationship to disordered eating (via increased depression) over and beyond that of the mother—and *vice versa*. Hence, both attachment figures must be included in the same model.

Potential Confounders

From a methodological point of view, a range of potential confounders could influence attachment, depressive symptoms and disordered eating producing spurious relations between them. This includes common genetics (Berrettini, 2004; Trace, Baker, Peñas-Lledó, & Bulik, 2013), personality or temperamental factors (e.g., impulsivity and perfectionism; Bardone-Cone et al., 2007; Cassin & von Ranson, 2005), problematic parenting (DeKlyen & Greenberg, 2016; Striegel-Moore et al., 2005) and response style biases (Decaluwé & Braet, 2004) – and even many others that we currently are not aware of. Such, often hard-to-measure, potential third variables make etiological interpretations from observational research uncertain. However, the Dynamic panel model (DPM)/fixed effects model (Bollen & Brand, 2010; Wichstrøm, Belsky, & Steinsbekk, 2017) is one data-analytical approach that enables one to discount one source of

confounding, namely those that do not change their value over time, irrespective of whether they are known or not.

Even though DPM narrows the gap between mere prediction and causation, time-*varying* factors (e.g., stressful life-events or pubertal timing [Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Striegel-Moore et al., 2005]) could still produce a spurious relation between insecure attachment and disordered eating. Nevertheless, many time-varying factors have, in fact, also shown stability ((e.g., life-events [Rudolph, 2009], bullying [Scholte, Engels, Overbeek, de Kemp, & Haselager, 2007]), which can be accounted for in DPM, thus ruling out one obstacle to etiological interpretation. To date, no investigation has applied DPM, or other related methodological approaches, to test a prospective mediational effect of depressive symptoms in the insecure attachment–disordered eating relation; a task we will undertake herein.

The current study

Available research supports the notion that insecure attachment predicts disordered eating in adolescents and there are robust reasons to assume that depressive symptoms could mediate this link. Nevertheless, no prior study has examined this possibility prospectively. Moreover, the relative importance of attachment to mothers and fathers in this mediation remains unexplored. To date, most of the literature concerning disordered eating has relied on female samples and overlooked its manifestation among boys, despite the fact that they constitute a substantial subset among those suffering from disordered eating (Sweeting et al., 2015). We therefore test—for the first time—(i) whether depressive symptoms mediate the predictive effect of insecure attachment on disordered eating, (ii) whether attachment to mothers and fathers are equally important in this respect, and (iii) for both genders, and finally (iv) whether reciprocal association exist, i.e. from depressive symptoms and disordered eating to insecure attachment. In line with theory and

previous findings, mostly based on attachment to the mother, we predict that depressive symptoms will mediate the effect of quality of attachment to mother on disordered eating — even when adjusting for attachment to the father, initial levels of depression, disordered eating, attachment to the mother, and all unmeasured time-invariant potential confounders. As theory and previous research did not provide strong evidence, we remain open to the comparative effect of attachment to the father as well as to any differential mediational effects for girls and boys.

Methods

Participants

This study is part of a larger project on the development of diverse psychological problems in adolescence (PSI2010-19793). The participating sample was recruited from different public and government-assisted schools randomly selected as representative of coastal and inland areas in the province of [Blinded for review] (Spain). Of the 15 schools initially contacted, 3 declined to participate. Enrollment was open to all students in grades 5–6 in primary school. At baseline (T1) the sample comprised 904 students (49.4% girls; M_{age} = 10.83; SD = 0.75). These participants were followed-up two (T2), (n = 880; 49.3% girls; M_{age} =12.85; SD = 0.77), four (T3) (n = 738; 50.5% girls; M_{age} = 14.98; SD = 0.84), and six years later (T4) (n = 473; 51.6% girls; M_{age} = 16.40; SD = 0.82). Importantly, the recruitment period covered two significant transitions in the Spanish education system — from Primary Education to Compulsory Secondary Education, which are mandatory (T1 to T2) and from Compulsory Secondary Education to upper secondary education or Baccalaureate, which is optional (T3 to T4).

Of the 904 participants included at baseline, self-report data were available for 97.2%, 81.5% and 51.2% of adolescents at T2, T3 and T4, respectively. Logistic regression analyses showed that at T4 attrition was lower among children reporting more secure attachment with the

father at T1 and whose parents had higher level of education. Attrition was higher at T4 among those reporting more eating symptoms at T3 (see Supplemental Table A1). The comparatively higher dropout in T4 could be due to difficulties in contacting the older participants who, by that time, following Spanish education system, may have had completed compulsory education and therefore left school.

According to the characteristics of the sample at the study entry, the parents' educational level (measured as the highest educational level attained by either parent) was as follows: 68% primary education, 20% secondary education, and 12% higher education. The ethnic composition of the sample was 98% Caucasian, 1% Arab, and 1% "other", which is consistent with the relatively homogeneous ethnic breakdown of the population of reference (Instituto Galego de Estatística, 2017)

Measures

Children's Eating Attitudes Test (*ChEAT*; Maloney, McGuire, & Daniels, 1988). The ChEAT is a 26-item self-report scale that assesses dysfunctional eating attitudes and behaviors among children and adolescents. Each item is rated on a 6-point scale ranging from 1 (*always*) to 6 (*never*) and scored from 0 to 3. Total sum scores range from 0 to 78. The Spanish version of the ChEAT used in this study has shown satisfactory internal consistency and concurrent validity (Senra, Seoane, Vilas, & Sánchez-Cao, 2007). Items 9 ("I vomit after I have eaten") and 26 ("I have the urge to vomit after eating") were not administered at T1 because they were deemed unsuitable for the age group studied. These items were therefore not considered at the remaining time points to maximize measurement equivalence. In the present study, α coefficients ranged from .85 to .90.

Children's Depression Inventory (*CDI*; Kovacs, 1992). The CDI is a 27-item self-report measure designed to evaluate depressive symptoms in children and adolescents. Each item has three response options that score 0 (absence of symptomatology), 1 (mild symptomatology), or 2 (severe symptomatology) (i.e., I am sad once in a while, I'm sad many times, I'm sad always). The Spanish version of the CDI used in this study has demonstrated adequate internal consistency, test–retest reliability, and concurrent and convergent validity (Del Barrio, Moreno, & López-Martínez, 1999). Total scores range from 0 to 54. In the present sample, α coefficients ranged from .84 to .86.

Inventory of Parent and Peer Attachment (*IPPA*; Armsden & Greenberg, 1987). The IPPA is a self-report measure of adolescents' perceptions of the quality of attachment towards mother, father, and peers. In the present study, we used the revised version that comprises 25 items for the mother scale, rated on a 5-point scale (from 1 = *never* to 5 = *always*). The overall score of attachment is obtained by summing responses of two subscales: degree of Mutual trust (e.g., "My mother me as I am") and Quality of communication (e.g., "I like to get my mother's point of view on things I am concerned about"), and by subtracting the score of the subscale of anger and alienation (e.g., "I feel angry with my mother"). Higher scores on Trust and Communication and lower score on Alienation indicate higher attachment security. The Spanish-language version of the IPPA (Pardo, Pineda, Carrillo, & Castro, 2006) used in this study has shown satisfactory internal consistency and concurrent validity. In our sample, α coefficients ranged from .72 to .95.

Procedure

This research received approval from the Bioethics Committee of the University of Santiago de Compostela and the Regional Government of Galicia (Xunta de Galicia, Spain).

Permission to carry out the study was obtained from the principals of all schools. Informed consent was obtained from the parents of the students who took part in the study. Participation was rewarded by inclusion in a prize draw for five laptops and four tablet computers at T3 and T4, respectively.

The data were collected in classrooms of 20–25 students. All groups were told that the purpose of the research was to explore a variety of protective and risk behaviors associated with youth wellbeing and they were given standard instructions for filling out the questionnaires. In order to answer any questions and prevent communication between the students, two trained research assistants were present in the classroom throughout the study session. In case of missing the scheduled data assessment (e.g., illness, truancy), the students were rescheduled for later evaluation in a short time.

Analysis Plan

The impact of attachment on eating problems via depression was tested using a DPM approach within a structural equation framework (Allison, Williams, & Moral-Benito, 2017; Bollen & Brand, 2010; Wichstrøm et al., 2017). The DPM consisted of a traditional autoregressive cross-lagged part and a time-invariant factor part. In the autoregressive cross-lagged part, attachment, disordered eating, and depressive symptoms measured during the last three waves of data collection were regressed on these symptoms two years earlier. The error terms of all predictors were allowed to correlate at each time point. The time-invariant factor part consisted of three latent factors loading on the three constructs at the last three time-points, while being correlated with all initial values, which were considered exogenous.

A fixed effects DPM implies that the effects of time-varying predictors (e.g., attachment) are adjusted for the confounding effect of unmeasured time-invariant factors. Thus, in the present

inquiry, the relations between attachment, depressive symptoms and disordered eating are adjusted for unmeasured time-invariant factors causing stability in attachment, depressive and eating symptoms, respectively. This approach is equivalent to the method of adjusting for confounders in ordinary regression.

A fixed effects DPM only utilizes within-person variation, i.e., participants serve as their own control. In contrast, a *random effects model* uses both within- and between-person information and thus has more statistical power than a fixed effects model. However, predictors are assumed to be uncorrelated with the time-invariant factor(s) in a random effects model. Random effects models are thus appropriate when predictors are proven to be uncorrelated with the time-invariant factor(s) and setting these correlations to 0 does not deteriorate the fit of the model.

Hybrid models consisting of both fixed and random effects are also possible (Firebaugh, Warner, & Massoglia, 2013). In hybrid models, some predictors are set to correlate with the time-invariant factor(s), whereas other predictors are not. A hybrid model retains the fixed effects advantage of adjusting for time-invariant factors (when these may influence the results) while being more parsimonious and more statistically powerful that a pure fixed effects model (Allison, 2009; Bollen & Brand, 2010; Firebaugh et al., 2013).

To arrive at the best-fitting model, we first examined whether random or fixed effects fit the data best. The Satorra-Bentler scaled $\Delta\chi^2$ test (Satorra, 2000) is a functional equivalent to the Hausmann test (Hausman, 1978) to make such a decision. Second, if a hybrid model does not deteriorate fit, this model would be preferred for power and parsimonious reasons.

To investigate mediation, we adjusted for all relevant direct effects, e.g. when examining the potential effect of insecure attachment at age 10 on eating problems at age 16 via depression

at age 12 and/or 14, we adjusted for the direct effects of depressive symptoms and attachment at age 12 as well as the direct effect of age-10 attachment. Bootstrapped asymmetric confidence intervals with 1000 draws were applied. We investigated whether identified mediations were gender-moderated by examining the 95% CIs of differences in mediation parameters between boys and girls with the Model Constraint procedure in Mplus 8.1 (Muthén & Muthén, 1998–2018). A robust maximum likelihood estimator was applied, which does not presuppose multivariate normality, and missingness was handled according to a full information maximum likelihood procedure, using all available data.

Results

Preliminary Analyses

Estimated means, standard deviations, and correlations between all study variables are presented in Table 1. As can be seen, attachment security was negatively correlated with later depressive symptoms and disordered eating at all-time points, albeit more so for attachment to the mother than to the father.

Direct Effects

Even though a random effects DPM did fit the data fairly well, $\chi2 = 157.18$, $df = 38$, $p < .001$, RMSEA = .059, 90% CI: .050-.069, CFI = .977, TLI = .932, a fixed effect model did show a substantially better fit , $\chi2 = 20.79$, $df = 22$, $p = .53$, RMSEA = .000, 90% CI: .000-.026, CFI = 1.000, TLI = 1.001, $\Delta \chi2 = 220.62$, $df = 16$, $p < .001$. However, a hybrid model where non-significant correlations were set to 0, did not produce any worse fit, $\chi2 = 30.55$, $df = 31$, $p = .49$, RMSEA = .000, 90% CI: .000-.024, CFI = 1.000, TLI = 1.000, $\Delta\chi2 = 9.82$, $df = 9$, $p = .39$) (Supplementary Figure 1). In this hybrid model, some effects regarding attachment to the father did emerge at some time points: more secure attachment at T1 predicted less depression at T2, β

= -.08, p = .033, and depression at T1 and T2 predicted diminished attachment two years later, at T2, β = -.09, p < .001 and at T3, β = -.09, p = .031, and more disordered eating at T1 did, anomalously, predicted more secure attachment at T2, β = -.06, p = .013. Acknowledging the small effects and most p-values bordering on significance, we tested whether setting paths to and from attachment to the father to zero did alter the fit of the model compared to freeing these parameters. The results revealed that the model with zero-effects for father did not prove to have a better fit, $\Delta\chi2$ = 10.42, df = 6, p = .11. Hence, considering the number of paths involving attachment to the father (and given that we had no prior expectations), the above significant paths could equally well have been zero. In contrast, setting mother parameters to zero resulted in considerably worse fit than allowing such parameters, $\Delta\chi2$ = 73.00, df = 6, p < .001.

Acknowledging the lack of prediction from attachment to father, further analyses were conducted with attachment to the mother only. A hybrid model of attachment to the mother where the following parameters were fixed to 0: between the time-invariant depression factor and the two other time-invariant factors; disordered eating and attachment; and the correlation between the time-invariant depression factor and eating problems at age 10, did not produce any worse fit than a fixed effects model, $\chi2$ = 12.29, df = 15, p = .66, RMSEA = .000, 90% CI: .000-.026, CFI = 1.000, TLI = 1.003, $\Delta\chi2$ = 1.33, df = 3, p = .72, and for parsimonious and power reasons this model was retained (Figure 1). All autoregressive paths reached statistical significance. Cross-lagged paths indicated that higher insecure attachment to the mother predicted more depressive symptoms two years later, from T1 to T2 and from T2 to T3. More depressive symptoms at T1 predicted more disordered eating throughout the whole period (from T1 to T4). Moreover, more disordered eating at T2 and T3 predicted more depressive symptoms

at T3 and T4. Finally, depressive symptoms had also a potentially detrimental effect on attachment security: more depressive symptoms at T2 and T3 predicted higher insecure attachment at T3 and T4 respectively.

Indirect Effects

To investigate mediation, we adjusted for all relevant direct effects, e.g. when examining the potential effect of insecure attachment at age 10 on eating problems at age 16 via depression at age 12 and/or 14, we adjusted for the direct effects of depressive symptoms and attachment at age 12 as well as the direct effect of age-10 attachment. Bootstrapped asymmetric confidence intervals with 1000 draws were applied. The fit for the model adjusting for direct effects provided a good fit, χ^2=8.12, *df* =11, *p*=.70, RMSE =.000, 90% CI: .000-.027, CFI=1.000, TLI=1.003. The results are depicted in Figure 2; with each mediational path having its own illustrative pattern. Higher insecure attachment to the mother at age 10 predicted more disordered eating at age 16, via increased depressive symptoms at age 12, which in turn predicted continued increased depressive symptoms at age 14, predicting more symptoms of disordered eating at age 16, *B*=-.10, 95% CI:.01-.21 (Figure 2, path 1). This amounted to 8.2% of the effect of age-10 attachment on age-16 disordered eating. Moreover, insecure attachment at age 10 predicted disordered eating at age 16 via continued insecure attachment at age 12, and then more depressive symptoms at age 14, and in turn increased disordered eating at age 16, *B*=-.13, 95% CI:.03-.23 (Figure 2, path 2), adding 5% to the share of the explained association.

Further on, there was an effect of insecure attachment at age 10 via increased depressive symptoms at age 12, thereafter disordered eating at age 14, and then on continued disordered eating at age 16, *B*= 15, 95% CI: 02-.31 (Figure 2, path 3); a 6.8% share of the association between attachment at age 10 and disordered eating at age 16. Insecure attachment at age 12

predicted more disordered eating at age 16 via increased depressive symptoms at age 14, *B*=-.26, 95% CI:.06-.41 (Figure 2, path 4); amounting to 30.0% of the total effect. The same effect was also seen two years earlier, from age 10 insecure attachment to age 14 disordered eating via depressive symptoms at age 12, *B*=.34, 95% CI: 02-.60 (Figure 2, path 5); 21.9% of the total effect.

To be noted, sum of all the indirect effects fully mediated effects of insecure attachment on later eating pathology, as there were no direct effects of insecure attachment at T1 on eating problems at T3, β=.11, *p*=.21 or insecure attachment on eating problems at T4, β=.04, *p*=.83. As indicated in Figure 1, there could be an effect from disordered eating at age 12 to reduced attachment to the mother at age 16 via increased depression at age 14. However, possibly due to the weakness of the disordered eating→depression link (β=.09, *p*=.05), the mediational effect turned out insignificant, *B*=-.02, 95% CI: -.05, .00, *p*=.23. No other reverse mediational effects--including from attachment or disordered eating to depression--were significant.

Child's Gender-specific Effects

Girls scored considerably higher than boys on depressive symptoms and disordered eating; a difference seemingly increasing with age (Table 1). To investigate whether the above indirect effects differed by gender, separate models for girls and boys were computed. Importantly, the differences in magnitude of the mediational effects were not different for the two genders (see supplemental Table A2), as the 95% CI of the difference between them always included 0.

Discussion

The present study examined, for the first time, whether depressive symptoms serve as a mechanism by which insecure attachment to parents increases disordered eating from middle childhood to adolescence. By following up a large community sample of 10-year olds with

biennial assessments until the age of 16, and by adjusting for initial levels of depressive symptoms, disordered eating, attachment and invariant-time factors, we found that insecure attachment to the mother at ages 10 and 12 years predicted disordered eating four years later via increased depressive symptoms. No effects involving attachment to the father were found. Moreover, our findings did not show any child's gender-specific or reverse (i.e. from depressive symptoms and disordered eating to insecure attachment) effects.

Depressive Symptomatology as Mediator between Insecure Attachment to the Mother and Disordered Eating

First, as regards the attachment-depression link, insecurely attached children at age 10 might be more prone to develop depressive symptoms at ages 12 and 14, possibly due to the cognitive-affective representations rooted in early negative experiences with care providers (Brumariu & Kerns, 2010; DeKlyen & Greenberg, 2016). Indeed, adolescents with early negative attachment experiences tend to focus selectively on disappointing aspects of a situation, which may further consolidate their negative self-concept over time (Morley & Moran, 2011). In addition, with the increasing cognitive capacities of early adolescence, youngsters tend to become preoccupied with what others may think of them (Somerville, 2013). Holding a negative self-concept - during this developmental period - may thus negatively bias the perception of feedback from others more strongly than during earlier or later periods (Hankin et al., 2005; Harter, 2006; Rudolph, 2009). Second, with respect to the depressive symptoms-disordered eating link, our results demonstrated that more depressive symptoms at ages 12 and 14, predicted more disordered eating at ages 14 and 16, respectively. These findings support the view that disordered eating may arise as a way to self-regulate or escape from negative emotions (Ferreiro et al., 2014; Goossens, Braet, Bosmans, & Decaluwé, 2011; Haedt-Matt & Keel, 2011).

Taken together, the aforementioned results suggest that children insecurely attached to the mother— who presumably perceive themselves negatively and without emotional support of their main attachment figure— may be extra vulnerable in the challenging transition from middle childhood to adolescence (e.g., body changes related to puberty finding themselves moving farther from the Western ideal beauty [Ricciardelli, 2012; Wertheim & Paxton, 2011], school transition [Evans, Borriello, & Field, 2018] negative interpersonal interactions [Rudolph, 2009]), resulting in increased depressive symptoms and may find refuge in abnormal eating practices (Tasca, 2018). For instance, binge eating might reduce negative affect and allow for momentary relief from reality yet, at the same time, perpetuating this maladaptive cycle through negative reinforcement (Faber et al., 2018). Similarly, as body image becomes crucial for adolescents' self-esteem (Ricciardelli, 2012; Wertheim & Paxton, 2011), boys and girls may engage in extreme dieting or in other harmful weight-control strategies (e.g., laxative use, excessive exercise) in an effort to achieve an ideal body shape and reduced unpleasant affect related to a negative image of themselves (e.g., Calzo et al., 2015; Johnson & Wardle, 2005).

The present findings substantiate existing literature supporting the role of insecure attachment to the mother as a risk factor in the development of disordered eating (e.g., Cortés-García et al., 2019; Goossens et al., 2012), yet expands it by indicating that depressive symptoms serve as one intermediate mechanism driving this relation.

Child's Gender-Specific Effects

The present investigation demonstrates that depressive symptoms play a central role in transferring the effect of attachment insecurity to the mother on the development of disordered eating, regardless of child's gender. However, our results run counter to studies showing that these effects are stronger in adolescent girls than in boys for depressive symptoms (Allen et al.,

2007; Lewis et al., 2015) as well as for disordered eating (Crespo et al., 2010). Conceivably, this discrepancy may partly be due to the fact that previous studies measured parent-child relationships (e.g., family connectedness, family conflict, lack of emotional closeness to parents) and not attachment quality per se. Moreover, these studies did not explicitly test a mediational model and did not adjust for time-invariant factors.

Nevertheless, the lack of gender specific-effects in our model possibly indicates the importance of attachment to the mother as *safe haven* in reducing the likelihood of depressive symptoms and disordered eating in girls and boys alike (e.g., Agerup et al., 2015; Goossens et al., 2012). Importantly, this result pinpoints that higher risk to develop disordered eating also pertains to boys (Sweeting et al., 2015), although their body image concerns and the magnitude of ED symptoms are lower (as echoed in our results).

In sum, based on the current findings, insecurely attached boys and girls who hold negative cognitive-affective representations, may think and behave in a manner that fosters disordered eating via an increase in depressive symptoms. Overall, however, the effect sizes reported were small to moderate.

Strengths and Limitations

We notice several strengths. First, the use of a multiwave longitudinal design with four measurement points in the transition from middle childhood to adolescence allowed for the examination of the direction of effects and for the prediction of changes in symptoms over time. Second, we included measures of attachment to both the mother and father, which made analyses of their relative importance possible. Third, the sample size made gender-specific analysis feasible. Lastly, the use of a strong analytic approach allowed for ruling out the impact of time-

invariant confounding, reducing the risk of capitalizing on spurious relation between the variables.

Despite these assets, the present findings should be interpreted in light of some limitations. First, our sample consisted of Spanish children, predominantly Caucasian. Therefore, extrapolating our results to other countries and cultures should be performed with caution. Second, the study relied solely on self-reports from one source, and the implied common method bias may have inflated associations. However, as the rater did not change over time, any prospective inflation in predictions due to common methods would be adjusted for by the latent time invariant factors we included in our analyses. Third, we examined attachment dimensionally, therefore we were not able to distinguish specific associations between an organized insecure attachment style (i.e., anxious, avoidant or even disorganized attachment) and disordered eating. Fourth, as with most longitudinal research, attrition occurred during the study (Gustavson, von Soest, Karevold, & Røysamb, 2012). The higher dropout at T4 may be due to the fact that by that time, following the Spanish education system, most adolescents had completed compulsory education and hence had left school. We also acknowledge that attrition at T4 among children whose parents had higher level of education and children with more eating symptoms at T3, may have affected both the internal and external validity of the research. Although non-random attrition affecting the results cannot be ruled out, we applied a FIML procedure, which produces less biased estimates than complete case analysis (Enders & Bandalos, 2001). Lastly, potentially relevant variables that may act as confounders (time *varying* factors such as unexpected life-events) were not included and could impact the associations between the observed variables and produce spurious relations.

Implications for Research and Practice

Future studies should test our suggested mediational model in different populations, such as clinical samples, adults, and participants from diverse ethnic backgrounds. Prospective research should also examine whether the present findings hold for other attachment figures, such as peers since some research indicates that peers may have different effects on the development of depressive symptoms and disordered eating (Gorrese, 2016; Le Grange et al., 2014). Also, future studies would benefit from inclusion of different measures such as clinical interviews and observational attachment measures. That said, a broad systematic review on different measurements of attachment specifically for children and adolescents (Jewell et al., 2019), recommends the use of the IPPA (Armsden & Greenberg, 1987) and the Child Attachment Interview (CAI; Shmueli-Goetz, Target, Fonagy, & Datta, 2008) as they have shown the best psychometric properties amongst observer-rated and self-report measures, respectively. Lastly, it should be ascertained whether different insecure attachment styles relates differently to disordered eating in adolescents. For instance, some studies have reported associations between avoidant insecure attachment and dietary restriction and between anxious insecure attachment and binge/purging behaviors (Behar, 2012; Dias, Soares, Klein, Cunha, & Roisman, 2011).

The current study highlights the significant influence that insecure attachment, especially to the mother, exerts on disordered eating via depressive symptoms in adolescence. It is noteworthy to consider the ethical challenges in interpreting direct connections between attachment and eating psychopathology as there is the great risk of "blaming" primary caregivers; instead, family members, particularly the mother, should be seen as a resource and part of the solution (Le Grange, Lock, Loeb, & Nicholls, 2010; Zachrisson & Skårderud, 2010). On a general level, a more detailed understanding of the specific family dynamics involved in the suggested process is needed for effective treatment and prevention. Family wise, prevention

programs that enhance interpersonal functioning by promoting better communication, cohesion, and stability in mother-child relationships could be effective in reducing the risk of both depression (Jacka et al., 2013; Sander & McCarty, 2005) and disordered eating (Faber et al., 2018). And, attachment wise, interpersonal and attachment-based interventions should address maladaptive cognitions about self and others, which may be rooted in early mental representations that foster the development of negative self-views, emotion dysregulation and difficult interpersonal functioning in children (Rieger et al., 2010; Stark, Streusand, Arora, & Patel, 2012), especially at a time of development when they are still modifiable (Bowlby, 1973; Pinquart, Feussner, & Ahnert, 2013). This is especially important as such intervention may disrupt the mediational chain by which insecure attachment leads to disordered eating.

Conclusion

The results of this study provide evidence that, regardless of child's gender, an increase in depressive symptoms may be an essential mechanism by which insecure attachment to mother increases adolescents' vulnerability to disordered eating prospectively. As such, the promotion of secure attachment relationships, particularly with the mother, during the transition from middle childhood to adolescence in both genders, in conjunction with other intrapersonal and environmental factors, might protect youths against depressive symptoms and the subsequent development of eating problems.

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Table 1. Descriptive statistics and bivariate correlations in the study variables (N = 904)

	Mean/*n* (*SD*/%)																	
Variables	Girls (*n* = 447)	Boys (*n* = 457)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. T1 Depressive symptoms	10.14 (6.09)	10.16 (6.32)	1	0.57**	0.39**	0.43**	0.35**	0.34**	0.31**	0.30**	-0.45**	-0.41**	-0.34**	-0.36**	-0.23*	-0.18**	-0.18**	-0.16**
2. T2 Depressive symptoms	11.02 (6.07)	10.58 (6.70)	0.54**	1	0.57**	0.52**	0.25**	0.47**	0.29**	0.35**	-0.58**	-0.56**	-0.46**	-0.49**	-0.28**	-0.28**	-0.25**	-0.19**
3. T3 Depressive symptoms	12.54 (6.20)	10.17 (5.71)	0.43**	0.50**	1	0.74**	0.26**	0.36**	0.47**	0.48**	-0.47**	-0.48**	-0.52**	-0.61**	-0.24**	-0.18**	-0.32**	-0.27**
4. T4 Depressive symptoms	13.54 (6.20)	9.84 (5.17)	0.45**	0.47**	0.63**	1	0.25**	0.27**	0.44**	0.46**	-0.43**	-0.44**	-0.50**	-0.61**	-0.16	-0.15**	-0.18**	-0.21**
5. T1 Disordered eating	17.18 (7.45)	17.79 (7.35)	0.35**	0.22**	0.15**	0.12	1	0.53**	0.46**	0.39**	-0.39**	-0.35**	-0.32**	-0.36**	-0.04**	0.02**	0.01**	0.02**
6. T2 Disordered eating	12.24 (9.03)	10.65 (8.95)	0.27**	0.38**	0.15**	0.15*	0.51**	1	0.64**	0.56**	-0.43**	-0.43**	-0.38**	-0.40**	-0.02**	0.02**	0.01**	0.02**
7. T3 Disordered eating	12.72 (10.17)	7.32 (6.82)	0.22**	0.30**	0.37**	0.34**	0.29**	0.46**	1	0.75**	-0.41**	-0.44**	-0.45**	-0.53**	-0.08**	-0.06**	-0.12**	-0.02**
8. T4 Disordered eating	13.13 (10.37)	6.19 (6.21)	0.32**	0.36**	0.44**	0.38**	0.38**	0.54**	0.67**	1	-0.51**	-0.54**	-0.53**	-0.57**	-0.09**	-0.10**	-0.11**	-0.10**
9. T1 Attachment to mother	6.46 (1.85)	6.32 (1.77)	-0.41**	-0.51**	-0.45**	-0.42**	-0.17**	-0.20**	-0.21**	-0.26**	1	0.88**	0.71**	0.71**	0.62**	0.54**	0.49**	0.43**
10. T2 Attachment to mother	6.36 (1.87)	6.02 (1.74)	-0.40**	-0.50**	-0.40**	-0.43**	-0.17**	-0.21**	-0.21**	-0.19**	0.91**	1	0.76**	0.77**	0.58**	0.53**	0.45**	0.40**
11. T3 Attachment to mother	5.97 (1.95)	5.55 (1.68)	-0.35**	-0.45**	-0.47**	-0.42**	-0.14**	-0.12*	-0.22**	-0.24**	0.72**	0.73**	1	0.83**	0.54**	0.48**	0.63**	0.46**
12. T4 Attachment to mother	5.91 (2.00)	5.49 (1.51)	-0.30**	-0.39**	-0.44**	-0.40**	-0.13	-0.17**	-0.26**	-0.22**	0.66**	0.67**	0.63**	1	0.50**	0.49**	0.52**	0.65**
13. T1	5.77 (1.91)	5.72 (1.84)	-0.12**	-0.32**	-0.15**	-0.09	-0.01**	-0.12**	-0.01**	-0.04**	0.55**	0.49**	0.36**	0.30**	1	0.86**	0.68**	0.57**

Attachment to father																		
14. T2 Attachment to father	5.48 (2.03)	5.50 (1.70)	-0.22**	-0.39**	-0.17**	-0.12	-0.01**	-0.12**	-0.02**	-0.03**	0.53**	0.51**	0.39**	0.35**	0.82**	1	0.67**	0.64**
15. T3 Attachment to father	5.12 (1.79)	5.02 (1.63)	-0.24**	-0.38**	-0.29**	-0.22*	-0.04**	-0.12**	-0.10**	-0.10**	0.47**	0.42**	0.53**	0.45**	0.63**	0.73**	1	0.68**
16. T4 Attachment to father	5.19 (1.97)	4.98 (1.61)	-0.17	-0.31*	-0.31**	-0.36*	-0.05**	-0.09**	-0.11**	-0.15**	0.44**	0.40**	0.49**	0.57**	0.56**	0.60**	0.69**	1

Note. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4. Correlations for girls are represented in shadowed area and for boys are represented in white area. *$p < .05$ ** $p < 0.01$

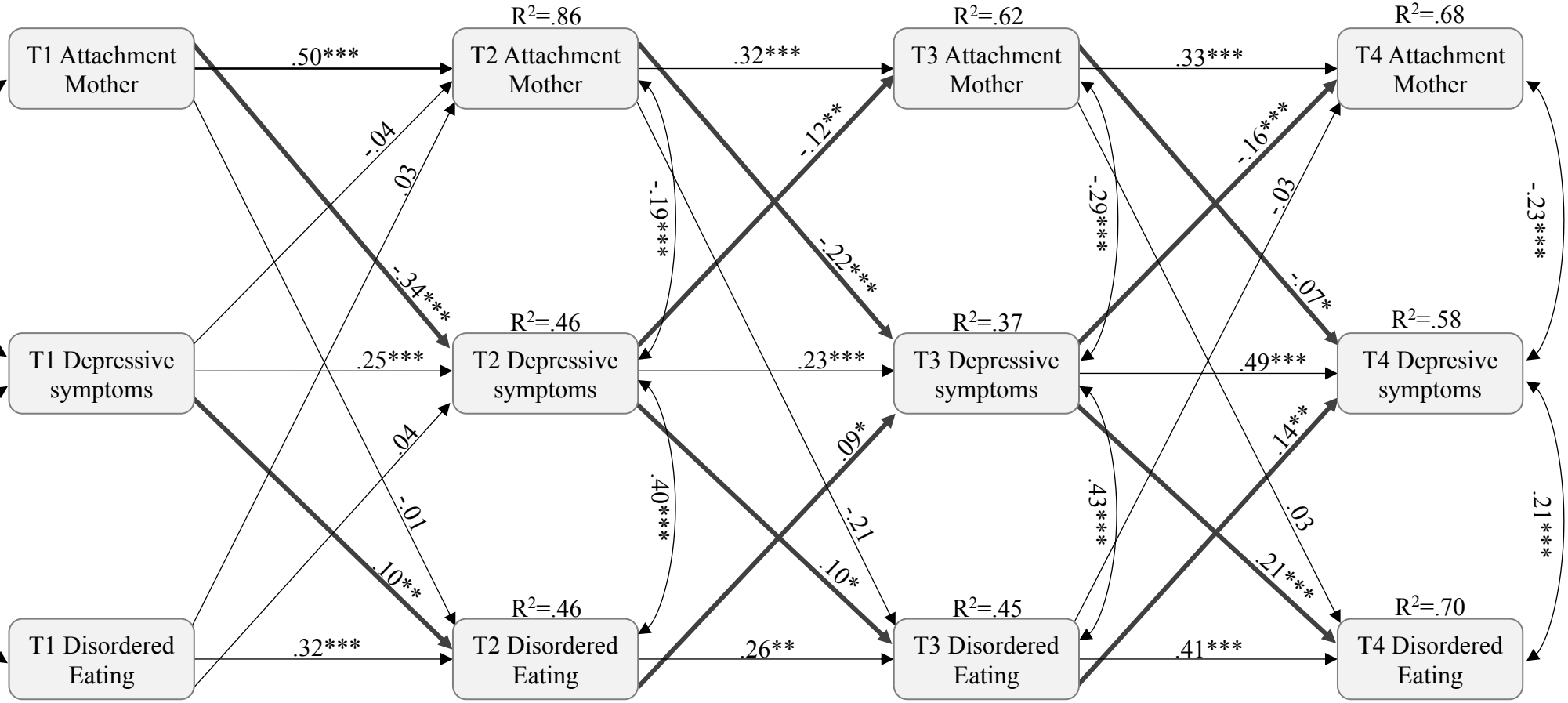


Fig. 1. Dual path model hybrid examining the association between depressive symptoms, disordered eating and attachment to mother among boys and girls. Standardized coefficients are depicted. Thick arrows = Significant cross-lag paths. FULL SAMPLE. $\chi 2=12.29$, df=15, p=.66, RMSEA = .000, 90%CI:.000-.026, CFI = 1.000, TLI = 1.003, $\Delta \chi 2=1.33$, df=3, p=.72. T1/T2/T3/T4 = Time 1/Time 2/Time 3/Time 4.
*** p < .001, ** p < .01, * p < .05.

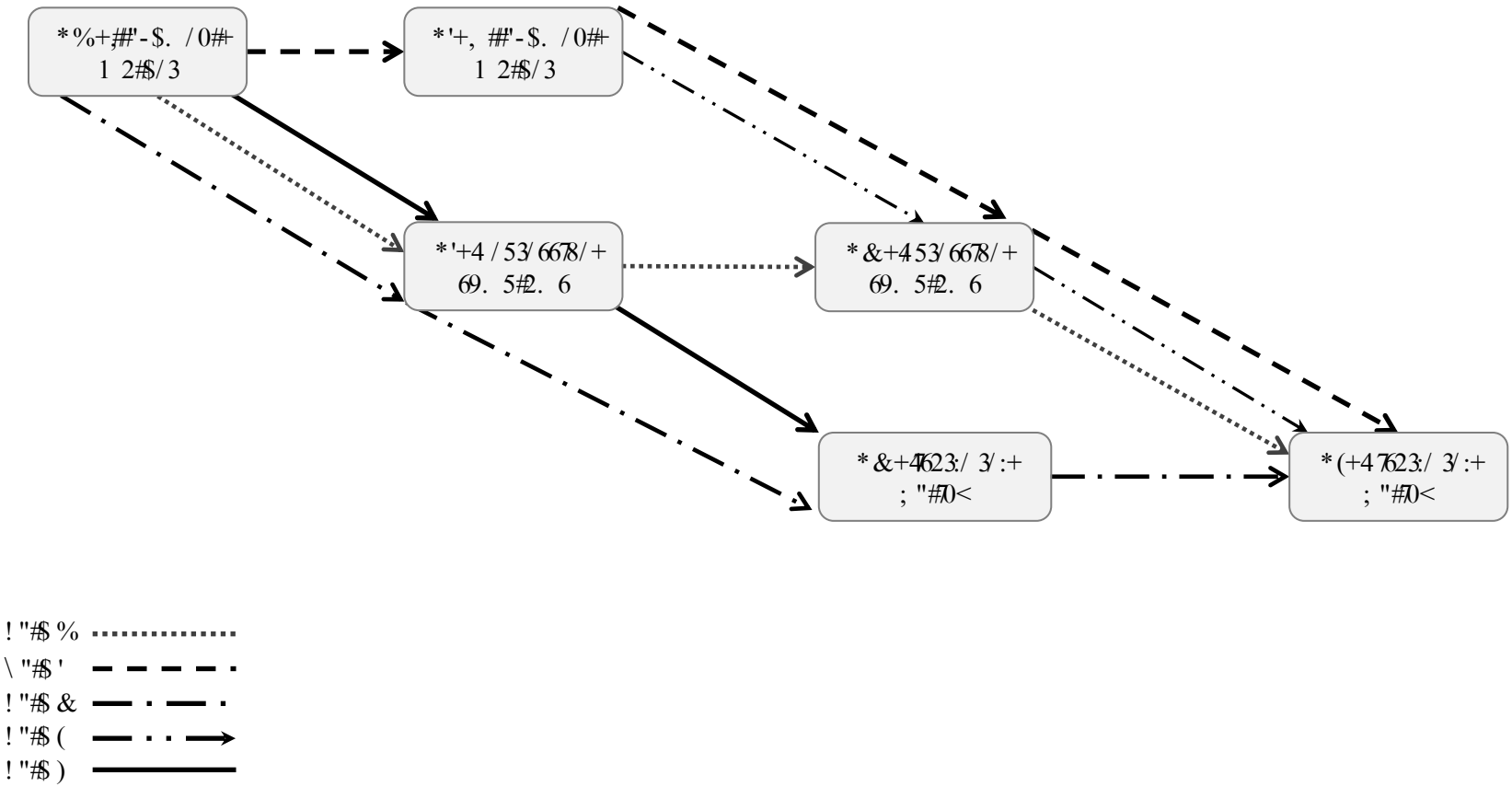


Fig. 2. N : 76=@>(8 97: ; =7^KB@7 H9576:C@HIC@B: <=8 6>6>? @A: =BB9C6=@>4: @D: : > 7: E5:BB6F: (B38 E@8 BG(T@957:5:7 : =@>? =>7 =@=@CA8: >@@8 9@A:5=8 9>? @A: DA9; B=8 E;: !(I@=>7=576: 7 C9: HH66>@B=5: 7: E6C@7!(L+1#!&+G(7&&G(E4)G(0NI OP 1!)))G(/)QRST!)))%!)+-G(RS1&!)))GVWS1&!)).!(V&'V+'V.' V"(1(V68 : (&V68 : (+'V68 : (.' V68 : ("!(

Appendix 2. Instruments

En este cuestionario no hay preguntas correctas o incorrectas, NO ES UN EXAMEN.
Sólo queremos conocer tu opinión. Lee despacio las preguntas antes de contestar.

Si te equivocas o tienes alguna dificultad LEVANTA LA MANO
Por favor, contesta con SINCERIDAD a todas las preguntas

Recuerda que este cuestionario es CONFIDENCIAL

MUCHAS GRACIAS POR TU COLABORACIÓN

LEE DETENIDAMENTE LOS SIGUIENTES ENUNCIADOS Y MARCA CON UNA CRUZ EL CUADRADO QUE MÁS SE PAREZCA A TU CASO

1. **Me da mucho miedo engordar demasiado.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

2. **Procuro no comer aunque tenga hambre.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

3. **Pienso mucho en la comida.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

4. **Me "atiborro" de comida, como si no pudiera parar de comer.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

5. **Corto la comida en trozos muy pequeños.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

6. **Tengo en cuenta las calorías que tienen los alimentos que como.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

7. **Evito comer alimentos con muchos hidratos de carbono (pan, pasteles, patatas, etc.).**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

8. **Creo que los demás preferirían que yo comiese más.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

9. **Vomito después de comer.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

10. **Me siento culpable después de comer mucho.**

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

11. Pienso mucho en querer estar más delgado/a.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

12. Pienso en quemar calorías cuando hago ejercicio.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

13. Los demás piensan que estoy demasiado delgado/a.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

14. Me preocupa la idea de tener grasa en el cuerpo.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

15. Tardo en comer más que los demás.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

16. Procuro no comer alimentos con azúcar.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

17. Como alimentos de régimen.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

18. Creo que la comida controla mi vida.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

19. Me controlo en las comidas

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

20. Noto que los demás me presionan para que coma.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

21. Dedico demasiado tiempo y pensamientos a la comida.

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

22. Me siento incómodo/a después de comer pasteles y dulces

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

23. Estoy haciendo dieta

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

24. Me gusta sentir el estómago vacío

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

25. Disfruto probando comidas nuevas

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

26. Tengo ganas de vomitar después de comer

Nunca Casi nunca Algunas veces Muchas veces Casi siempre Siempre

POR FAVOR, SEÑALA CUÁL DE LAS AFIRMACIONES DE CADA GRUPO DESCRIBE MEJOR EL MODO EN EL QUE SE HA SENTIDO **DURANTE LAS DOS ÚLTIMAS SEMANAS, INCLUYENDO EL DÍA DE HOY**.

Marca con un círculo el número de la afirmación que elijas. Si dentro de un mismo grupo, hay más de una afirmación que consideres aplicable a tu caso, márquela también.

1.	0	No me siento triste habitualmente.
	1	Me siento triste gran parte del tiempo.
	2	Me siento triste continuamente.
	3	Me siento tan triste que no puedo soportarlo.
2.	0	No estoy desanimado/a sobre mi futuro.
	1	Me siento más desanimado/a sobre mi futuro que antes.
	2	No espero que las cosas mejoren.
	3	Siento que el futuro es desesperanzador y que las cosas sólo empeorarán.
3.	0	No me siento fracasado/a.
	1	He fracasado más de lo que debería.
	2	Cuando miro atrás, veo fracaso tras fracaso.
	3	Me siento una persona totalmente fracasada.
4.	0	Disfruto de las cosas que me gustan tanto como antes.
	1	No disfruto de las cosas tanto como antes.
	2	Tengo muy poco placer con las cosas con las que antes disfrutaba.
	3	No tengo ningún placer con las cosas con las que antes disfrutaba.
5.	0	No me siento especialmente culpable.
	1	Me siento culpable de muchas cosas que he hecho o debería haber hecho.
	2	Me siento bastante culpable la mayor parte del tiempo.
	3	Me siento culpable constantemente
6.	0	No siento que esté siendo castigado/a.
	1	Siento que puedo ser castigado/a.
	2	Espero ser castigado/a.
	3	Siento que estoy siendo castigado.
7.	0	Siento lo mismo que antes sobre mí mismo.
	1	He perdido confianza en mí mismo/a.
	2	Estoy decepcionado conmigo mismo/a.
	3	No me gusto.
8.	0	No me critico o me culpo más que antes.
	1	Soy más crítico/a conmigo mismo de lo que solía ser.
	2	Critico todos mis defectos.
	3	Me culpo por todo lo malo que sucede.
9.	0	No tengo ningún pensamiento de suicidio
	1	Tengo pensamientos de suicidio, pero no los llevaría a cabo.
	2	Me gustaría suicidarme.
	3	Me suicidaría si tuviese la oportunidad.
10.	0	No lloro más de lo que solía hacerlo.
	1	Lloro más de lo que solía hacerlo.
	2	Lloro por cualquier cosa.
	3	Tengo ganas de llorar continuamente, pero no puedo.

11.	0	No estoy más inquieto/a o agitado/a que de costumbre.
	1	Me siento más inquieto/a o agitado/a que de costumbre.
	2	Estoy tan inquieto/a y agitado/a que me cuesta estarme quieto.
	3	Estoy tan inquieto/a y agitado/a que tengo que estar continuamente moviéndome o haciendo algo.
12.	0	No he perdido el interés por otras personas o actividades.
	1	Estoy menos interesado/a que antes por otras personas o actividades.
	2	He perdido la mayor parte de mi interés por los demás o por las cosas.
	3	Me resulta difícil interesarme en algo.
13	0	Tomo decisiones más o menos como siempre.
	1	Tomar decisiones me resulta más difícil que de costumbre.
	2	Tengo mucha más dificultad en tomar decisiones que de costumbre.
	3	Tengo problemas para tomar cualquier decisión.
14	0	No me siento inútil.
	1	No me considero tan valioso/a y útil como solía ser.
	2	Me siento inútil en comparación con otras personas.
	3	Me siento completamente inútil.
15.	0	Tengo tanta energía como siempre.
	1	Tengo menos energía de la que solía tener.
	2	No tengo suficiente energía para hacer muchas cosas.
	3	No tengo suficiente energía para hacer nada.
16.	0	No he experimentado ningún cambio en mi tiempo de sueño.
	1a	Duermo algo más de lo habitual.
	1b	Duermo algo menos de lo habitual.
	2a	Duermo mucho más de lo habitual.
	2b	Duermo mucho menos de lo habitual.
	3b	Me despierto 1 o 2 horas más temprano y no puedo volver a dormirme
17.	0	No estoy más irritable de lo habitual.
	1	Estoy más irritable de lo habitual.
	2	Estoy mucho más irritable de lo habitual.
	3	Estoy irritable continuamente.
18.	0	No he experimentado ningún cambio en mi apetito.
	1a	Mi apetito es algo menor de lo habitual.
	1b	Mi apetito es algo mayor de los habitual.
	2a	Mi apetito es mucho menor que antes.
	2b	Mi apetito es mucho mayor de lo habitual.
	3b	Tengo ganas de comer continuamente.
19.	0	Puedo concentrarme tan bien como siempre.
	1	No puedo concentrarme tan bien como habitualmente.
	2	Me cuesta mantenerme concentrado en algo durante mucho tiempo.
	3	No puedo concentrarme en nada.
20.	0	No estoy más cansado/a que de costumbre.
	1	Me canso más fácilmente que de costumbre.
	2	Estoy demasiado cansado/a para hacer muchas cosas que antes solía hacer.
	3	Estoy demasiado cansado/a para hacer la mayoría de las cosas que antes solía hacer.
21.	0	No he notado ningún cambio reciente en mi interés por el sexo
	1	Estoy menos interesado por el sexo de lo que solía estar.
	2	Estoy mucho menos interesado por el sexo ahora.
	3	He perdido completamente el interés por el sexo.

LEE DETENIDAMENTE LOS SIGUIENTES ENUNCIADOS Y MARCA CON UNA CRUZ EL CUADRADO QUE MÁS SE PAREZCA A TU CASO

****** EN RELACIÓN CON TU PADRE***:***

1. Mi padre respeta mis sentimientos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

2. Creo que mi padre es buen padre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

3. Desearía tener otro padre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

4. Mi padre me quiere como soy.

Nunca Casi nunca Algunas veces Casi siempre Siempre

5. Me gusta saber la opinión de mi padre sobre las cosas que me preocupan.

Nunca Casi nunca Algunas veces Casi siempre Siempre

6. Creo que no sirve de nada demostrarle mis sentimientos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

7. Mi padre nota cuando estoy disgustado/a por algo.

Nunca Casi nunca Algunas veces Casi siempre Siempre

8. Me da vergüenza hablar de mis problemas con mi padre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

9. Mi padre espera demasiado de mí.

Nunca Casi nunca Algunas veces Casi siempre Siempre

10. Me enfado fácilmente con mi padre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

11. Estoy triste muchas más veces de lo que mi padre cree.

Nunca Casi nunca Algunas veces Casi siempre Siempre

12. Cuando discutimos las cosas, mi padre tiene en cuenta mi opinión.

Nunca Casi nunca Algunas veces Casi siempre Siempre

13. Mi padre confía en mí.

Nunca Casi nunca Algunas veces Casi siempre Siempre

14. No molesto a mi padre con mis problemas porque ya tiene los suyos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

15. Mi padre me ayuda a entenderme mejor.

Nunca Casi nunca Algunas veces Casi siempre Siempre

16. Le cuento a mi padre mis problemas y preocupaciones.

Nunca Casi nunca Algunas veces Casi siempre Siempre

17. Estoy enfadado/a con mi padre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

18. Mi padre no me presta mucha atención.

Nunca Casi nunca Algunas veces Casi siempre Siempre

19. Mi padre me pide que le cuente mis problemas.

Nunca Casi nunca Algunas veces Casi siempre Siempre

20. Mi padre me entiende.

Nunca Casi nunca Algunas veces Casi siempre Siempre

21. Cuando estoy enfadado/a por algo, mi padre trata de entenderme.

Nunca Casi nunca Algunas veces Casi siempre Siempre

22. Confío en mi padre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

23. Mi padre no me entiende cuando lo paso mal.

Nunca Casi nunca Algunas veces Casi siempre Siempre

24. Puedo contar con mi padre cuando necesito desahogarme.

Nunca Casi nunca Algunas veces Casi siempre Siempre

25. Si mi padre me ve preocupado, me pregunta qué me pasa.

Nunca Casi nunca Algunas veces Casi siempre Siempre

LEE DETENIDAMENTE LOS SIGUIENTES ENUNCIADOS Y MARCA CON UNA CRUZ EL CUADRADO QUE MÁS SE PAREZCA A TU CASO

****** EN RELACIÓN CON TU MADRE***:***

1. Mi madre respeta mis sentimientos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

2. Creo que mi madre es buena madre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

3. Desearía tener otra madre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

4. Mi madre me quiere como soy.

Nunca Casi nunca Algunas veces Casi siempre Siempre

5. Me gusta saber la opinión de mi madre sobre las cosas que me preocupan.

Nunca Casi nunca Algunas veces Casi siempre Siempre

6. Creo que no sirve de nada demostrarle mis sentimientos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

7. Mi madre nota cuando estoy disgustado/a por algo.

Nunca Casi nunca Algunas veces Casi siempre Siempre

8. Me da vergüenza hablar de mis problemas con mi madre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

9. Mi madre espera demasiado de mí.

Nunca Casi nunca Algunas veces Casi siempre Siempre

10. Me enfado fácilmente con mi madre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

11. Estoy triste muchas más veces de lo que mi madre cree.

Nunca Casi nunca Algunas veces Casi siempre Siempre

12. Cuando discutimos las cosas, mi madre tiene en cuenta mi opinión.

Nunca Casi nunca Algunas veces Casi siempre Siempre

13. Mi madre confía en mi.

Nunca Casi nunca Algunas veces Casi siempre Siempre

14. No molesto a mi madre con mis problemas porque ya tiene los suyos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

15. Mi madre me ayuda a entenderme mejor.

Nunca Casi nunca Algunas veces Casi siempre Siempre

16. Le cuento a mi madre mis problemas y preocupaciones.

Nunca Casi nunca Algunas veces Casi siempre Siempre

17. Estoy enfadado/a con mi madre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

18. Mi madre no me presta mucha atención.

Nunca Casi nunca Algunas veces Casi siempre Siempre

19. Mi madre me pide que le cuente mis problemas.

Nunca Casi nunca Algunas veces Casi siempre Siempre

20. Mi madre me entiende.

Nunca Casi nunca Algunas veces Casi siempre Siempre

21. Cuando estoy enfadado por algo, mi madre trata de entenderme.

Nunca Casi nunca Algunas veces Casi siempre Siempre

22. Confío en mi madre.

Nunca Casi nunca Algunas veces Casi siempre Siempre

23. Mi madre no me entiende cuando lo paso mal.

Nunca Casi nunca Algunas veces Casi siempre Siempre

24. Puedo contar con mi madre cuando necesito desahogarme.

Nunca Casi nunca Algunas veces Casi siempre Siempre

25. Si mi madre me ve preocupado, me pregunta que me pasa.

Nunca Casi nunca Algunas veces Casi siempre Siempre

LEE DETENIDAMENTE LOS SIGUIENTES ENUNCIADOS Y MARCA CON UNA CRUZ EL CUADRADO QUE MÁS SE PAREZCA A TU CASO

****** EN RELACIÓN CON TUS AMIGOS ÍNTIMOS***:***

1. Me gusta que mis amigos me pregunten por qué estoy preocupado.

Nunca Casi nunca Algunas veces Casi siempre Siempre

2. Cuando hablamos, mis amigos tienen en cuenta mi opinión.

Nunca Casi nunca Algunas veces Casi siempre Siempre

3. Me da vergüenza contarles mis problemas a mis amigos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

4. Mis amigos me comprenden.

Nunca Casi nunca Algunas veces Casi siempre Siempre

5. Mis amigos me animan a contarles mis problemas.

Nunca Casi nunca Algunas veces Casi siempre Siempre

6. Mis amigos me aceptan como soy.

Nunca Casi nunca Algunas veces Casi siempre Siempre

7. **Mis amigos no comprenden que tenga malos momentos.**

Nunca Casi nunca Algunas veces Casi siempre Siempre

8. Me siento solo/a o aislado/a cuando estoy con mis amigos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

9. Mis amigos escuchan lo que tengo que decir.

Nunca Casi nunca Algunas veces Casi siempre Siempre

10. Creo que mis amigos son unos buenos amigos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

11. Me resulta fácil hablar con mis amigos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

12. Cuando estoy enfadado/a por algo mis amigos tratan de comprenderme.

Nunca Casi nunca Algunas veces Casi siempre Siempre

13. Mis amigos me ayudan a comprenderme mejor.

Nunca Casi nunca Algunas veces Casi siempre Siempre

14. Mis amigos se preocupan por cómo estoy.

Nunca Casi nunca Algunas veces Casi siempre Siempre

15. Estoy enfadado/a con mis amigos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

16. Confío en mis amigos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

17. Mis amigos respetan mis sentimientos.

Nunca Casi nunca Algunas veces Casi siempre Siempre

18. Tengo muchos más problemas de los que mis amigos creen.

Nunca Casi nunca Algunas veces Casi siempre Siempre

19. Creo que mis amigos se enfadan conmigo sin motivo.

Nunca Casi nunca Algunas veces Casi siempre Siempre

20. Puedo hablar con mis amigos acerca de mis problemas y dificultades.

Nunca Casi nunca Algunas veces Casi siempre Siempre

21. Si mis amigos saben que estoy molesto por algo me preguntan por qué es.

Nunca Casi nunca Algunas veces Casi siempre Siempre

Appendix 3. Bioethics Committee

USC
UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

VICERREITORÍA DE INVESTIGACIÓN
E INNOVACIÓN
Oficina de Investigación e Tecnoloxía
Unidade de Xestión de Produción Científica e Tecnolóxica

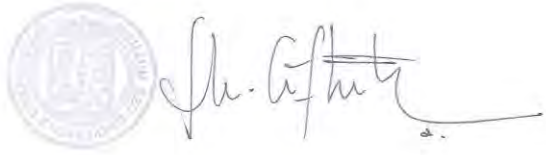
Edificio CACTUS – Campus universitario sur
15782 Santiago de Compostela
Tel. 981 547 040 - Fax 981 547 077

JOSÉ MANUEL CIFUENTES MARTÍNEZ, PROFESOR TITULAR E PRESIDENTE DO COMITÉ DE BIOÉTICA DA UNIVERSIDADE DE SANTIAGO DE COMPOSTELA,

INFORMA:

Que de acordo co establecido nas bases da orde do 24 de xuño 2009 (D.O.G. 6 xullo), pola que se convocan as subvencións correspondentes aos Programas sectoriais de investigación aplicada, PEME I+D e I+D Suma do Plan Galego de Investigación, Desenvolvemento e Innovación Tecnolóxica (Incite) para o ano 2009 , o proxecto de investigación titulado: **"Variables biopsicosociais predictoras da psicopatoloxía alimentaria e depresiva en adolescentes de ambos sexos: un estudo lonxitudinal de oito anos"** do que é Investigador Principal o Profesor/a Don/a **Carmen Senra Rivera** foi examinado polo Comité de Bioética desta Universidade, reunido o trinta de xullo do presente ano, cumprindo no seu protocolo experimental os requisitos esixidos.

E para que así conste expídese o presente documento en Santiago de Compostela a trinta de xullo do ano dous mil nove.



Appendix 4. Permission letter for the head of teachers

Santiago de Compostela 7, junio de 2004

Estimado Sr/Sra. Director/a,

Somos un grupo de investigación del Departamento de Psicología Clínica y Psicobiología de la Universidad de Santiago de Compostela que estamos desarrollando un proyecto de subvencionado por el Ministerio de Ciencia y Tecnología sobre "*Factores de riesgo y de protección en el bienestar psicológico de los escolares*". Me dirijo a Ud., en calidad de investigadora principal de dicho grupo, para informarle que el Centro que usted dirige ha sido seleccionado para participar en el estudio y para solicitarle, así mismo, su colaboración.

Como ya tuve ocasión de comentarle telefónicamente, se trata de un estudio en el que participarían los escolares de 5º y 6º curso, se les administraría un cuestionario y una entrevista individual sobre hábitos alimentarios, estrategias de afrontamiento, características de personalidad y estado de ánimo y, además, se les tallaría y pesaría a todos. Los datos son estrictamente confidenciales y con fines, únicamente, de investigación. Nuestra propuesta no pretende alterar la dinámica escolar. Al acabar el estudio, recibirán un Informe con los resultados relativos a su Centro.

Esta carta también pretende avanzarle que nos pondremos, de nuevo, en contacto telefónico con Ud. para concretar calendario y explicar de manera más detallada, si fuera preciso, los objetivos del estudio, la participación concreta que se solicita de los estudiantes, y todos aquellos pormenores que tanto Ud. como el Consejo Escolar soliciten. Para que los estudiantes participen en el estudio, además de su autorización, deberán contar con el consentimiento informado de sus padres y decidir voluntariamente su participación.

Esperamos poder contar con su valiosa colaboración, muchas gracias por su tiempo.

Atentamente,

Fdo.: Carmen Senra Rivera
Dpto. de Psicología Clínica y Psicobiología
Universidad de Santiago de Compostela
Tfno.: 981 563100 ext13767
e-mail: pc033767@usc.es

Appendix 5. Informed consent by the parents

El/la abajo firmante D./Dña……..……,

en calidad de padre/madre/tutor/tutora del alumno/a:

……

AUTORIZA su participación en el estudio que está llevando a cabo un grupo de investigación de la Universidad de Santiago de Compostela, sobre *Factores de riesgo y factores protectores en el bienestar psicológico de los escolares*.

En……a……de……de 20

Fdo……

Appendix 6. PRISMA CHECKLIST

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	

Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	

Appendix 7. Quality assessment checklist (studies 3 and 4)

Items		Yes	No
1.	Is there hypothesis/aim/objective of the study clearly described? (Objectives are formulated adequately: precise, clear and comprehensive)		
2.	Is the study design appropriate to objectives?		
3.	Is the study sample representative? (Participants are recruited from a representative setting that relates to the studies aims and hypotheses)		
4.	Were the psychometric characteristics of the mediator and outcome variables reported? (Computed from the present study or a reference provided)		
5.	Were statistically appropriate/ acceptable methods of data analysis used? (This includes the product of coefficient approach with bootstrapped confidence intervals, structural equation modelling, latent growth modelling, and causal mediation analysis)		
6.	Did the study ascertain whether changes in the mediating variable preceded changes in the outcome variable?		
7.	Did the study ascertain whether changes in the predictor variable preceded changes in the mediator variable?		
8.	Are the main findings of the study clearly described? (Simple outcome data should be reported for all major findings so that the reader can check the major analysis and conclusions)		
9.	Did the study control for possible confounding factors? (Variables that may impact on results are identified and controlled for in terms of statistical analysis)		

Appendix 8. Detailed extracted and coded data for meta-analysis (study 3)

Author/s (Year)/Country	Sample	Gender	Clinical vs. Non-clinical	IV	Mediator	DV	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Bäck (2011)/Sweden	35	1	0	Fearful	BD	Eating problems	0.42	0.72	0.58	0.30	3
Koskina & Giovazolias (2010)/Greece	381	1	0	Anxious	BD	Dietary symptoms	0.45	0.70	0.24	0.32	5
Koskina & Giovazolias (2010)/Greece	381	1	0	Anxious	BD	Bulimia symptoms	0.45	0.62	0.22	0.28	5
Koskina & Giovazolias (2010)/Greece	100	0	0	Anxious	BD	Dietary symptoms	0.24	0.62	0.24	0.15	5
Monteleone et al. (2017)/Italy	113	1	1	Avoidant	BD	EDI-2-Interoceptive awareness	0.30	0.49	0.33	0.15	6
Monteleone et al. (2017)/Italy	113	1	1	Avoidant	BD	EDI-2-Impulsivity	0.30	0.40	0.29	0.12	6
Tasca et al. (2006)/Canada	268	1	1	Anxious	BD	Drive for thinness	0.31	0.39	0.40	0.12	4
Tasca et al. (2006)/Canada	268	1	1	Anxious	BD	Dietary restraint	0.31	0.05	0.29	0.02	4
Tasca et al. (2006)/Canada	268	1	1	Avoidant	BD	Drive for thinness	0.23	0.39	0.31	0.09	4
Tasca et al. (2006)/Canada	268	1	1	Avoidant	BD	Dietary restraint	0.23	0.05	0.25	0.01	4
Bamford & Halliwell (2009)/UK	213	1	0	Anxious	SC	EDI-Drive for thinness	0.30	0.74	0.36	0.22	5

Author/s (Year)/Country	Sample	Gender	Clinical vs. Non-clinical	IV	Mediator	DV	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Bamford & Halliwell (2009)/UK	213	1	0	Anxious	SC	EDI-Body dissatisfaction	0.30	0.74	0.30	0.22	5
Bamford & Halliwell (2009)/UK	213	1	0	Anxious	SC	EDI-Bulimia	0.30	0.74	0.35	0.22	5
Ty & Francis (2013)/Australia	247	1	0	Anxious	SC	Disordered eating	0.27	0.44	0.37	0.12	5
Ty & Francis (2013)/Australia	247	1	0	Avoidant	SC	Disordered eating	0.24	0.44	0.32	0.11	5
De Paoli et al. (2017b)/Australia	122	2	1	Avoidant	SC	Disordered eating	-0.49	-0.53	0.30	0.26	6
Boone (2013)/Belgium	328	2	0	Avoidant(mother)	P	EDI-2-Bulimia	0.13	0.31	0.13	0.04	6
Boone (2013)/Belgium	328	2	0	Avoidant(father)	P	EDI-2-Bulimia	0.20	0.28	0.15	0.05	6
Dakanalis et al. (2013)/Italy	403	1	1	Anxious	P	ED symptoms	0.48	0.46	0.31	0.22	6
Dakanalis et al. (2013)/Italy	403	1	1	Avoidant	P	ED symptoms	0.54	0.46	0.43	0.25	6
Shanmugan, Jowett & Meyer (2012)/UK	411	2	0	Anxious	P	Eating pathology	0.43	0.35	0.38	0.15	7
Shanmugan, Jowett & Meyer (2012)/UK	411	2	0	Avoidant	P	Eating pathology	0.26	0.35	0.18	0.09	7
Han & Pistole (2014)/US	381	2	0	Insecure	ER	Binge eating	0.79	0.46	0.37	0.35	6
Tasca et al. (2009)/Canada	310	1	1	Anxious	ER	ED symptoms	-0.64	-0.37	0.35	0.24	6
Ty & Francis	247	1	0	Anxious	ER	Disordered	0.48	0.53	0.37	0.25	5

Author/s (Year)/Country	Sample	Gender	Clinical vs. Non-clinical	IV	Mediator	DV	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
(2013)/Australia						eating					
Ty & Francis (2013)/Australia	247	1	0	Avoidant	ER	Disordered eating	0.39	0.53	0.32	0.21	5
Van Durme, Braet & Goossens (2015)/Belgium	952	2	0	Anxious	ER	Restraint eating	0.29	0.22	0.17	0.06	7
Van Durme, Braet & Goossens (2015)/ Belgium	952	2	0	Anxious	ER	Eating problems concerns	0.29	0.30	0.26	0.09	7
Van Durme, Braet & Goossens (2015)/ Belgium	952	2	0	Avoidant	ER	Restraint eating	0.07	0.22	0.15	0.02	7
Van Durme, Braet & Goossens (2015)/Belgium	952	2	0	Avoidant	ER	Eating problems concerns	0.07	0.30	0.13	0.02	7
*Jakovina et al. (2018)/ Croatia	100	1	2	Anxious	ER	Bulimic symptoms	0.64	0.57	0.48	0.36	5
Eggert, Levendosky & Klump (2007)/US	85	1	0	Anxious	N	ED symptoms	0.94	0.34	0.49	0.32	4
Münch, Hunger & Schweitzer (2016)/ Germany	253	1	0	Insecure	N	ED symptoms	0.56	0.48	0.53	0.27	3
Shanmugan, Jowett & Meyer (2012)/UK	411	2	0	Anxious	D	Eating pathology	0.58	0.47	0.38	0.27	7
Shanmugan, Jowett & Meyer (2012)/UK	411	2	0	Avoidant	D	Eating pathology	0.23	0.47	0.18	0.11	7

Author/s (Year)/Country	Sample	Gender	Clinical vs. Non-clinical	IV	Mediator	DV	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Schembri & Evans (2008)/Australia	225	1	0	Anxious	D	Bulimic symptoms	0.56	0.58	0.42	0.32	5
Pepping et al. (2015)/ Australia	144	1	0	Anxious	M	Eating pathology	-0.39	-0.32	0.41	0.12	5
Pepping et al. (2015)/ Australia	144	1	0	Avoidant	M	Eating pathology	-0.41	-0.32	0.32	0.13	5
Pepping et al. (2015)/ Australia	55	1	1	Anxious	M	Eating pathology	-0.38	-0.46	0.26	0.17	5
Pepping et al. (2015)/ Australia	55	1	1	Avoidant	M	Eating pathology	-0.27	-0.46	0.22	0.12	5
*Redondo & Luyten (2018)/ Spain	361	1	2	Anxious	M	Dieting	-0.38	-0.38	0.31	0.14	5
Redondo & Luyten (2018)/ Spain	361	1	2	Anxious	M	Bulimia	-0.38	-0.37	0.3	0.14	5
Redondo & Luyten (2018)/ Spain	361	1	2	Anxious	M	Oral control	-0.38	-0.23	0.25	0.09	5
Redondo & Luyten (2018)/ Spain	361	1	2	Avoidant	M	Dieting	-0.38	-0.38	0.3	0.14	5
Redondo & Luyten (2018)/ Spain	361	1	2	Avoidant	M	Bulimia	-0.38	-0.37	0.28	0.14	5
Redondo & Luyten (2018)/ Spain	361	1	2	Avoidant	M	Oral control	-0.38	-0.23	0.23	0.09	5
Redondo & Luyten (2018)/ Spain	361	1	2	Avoidant	M	Dieting	-0.35	-0.38	0.24	0.13	5

Author/s (Year)/Country	Sample	Gender	Clinical vs. Non-clinical	IV	Mediator	DV	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Redondo & Luyten (2018)/ Spain	361	1	2	Avoidant	M	Bulimia	-0.35	-0.37	0.23	0.13	5
Redondo & Luyten (2018)/ Spain	361	1	2	Avoidant	M	Oral control	-0.35	-0.23	0.15	0.08	5

Note. Gender: 0 = Males, 1 = Females, 2 = Both; Clinical = Coded as 1; Clinical and Non-Clinical = 2; IV = Insecure attachment style; Mediator: BD = Body Dissatisfaction, SC = Social Comparison, P = Perfectionism; ER = Maladaptive emotion regulation; N = Neuroticism; D = Depressive symptoms; M = Mindfulness; DV = Dependent variable; Path *a* = association between independent variable and mediator; Path *b* = association between mediator and dependent variable; Path *c* = total effect of the independent variable on the dependent variable; *a*b* = the indirect effect of the independent variable on the dependent variable controlling the mediator.

*These studies were only computed for the total effect and could be not stratified by type of sample as they combined clinical and non-clinical samples to test the mediational effects.

Appendix 9. Fixed effects pooled correlation coefficients of path a, path b, indirect effect and total effect; heterogeneity and mediation ratio (study 3)

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Total	21	0.29 (0.27-0.31)	0.98	0.32 (0.30-0.35)	0.97	0.26 (0.24-0.28)	0.92	0.15 (0.12-0.17)	0.85	0.58
Clinical sample	6	0.01 (-0.04-0.07)	0.99	0.08 (0.02-0.13)	0.98	0.11 (0.06-0.17)	0.96	0.02 (-0.03-0.08)	0.90	0.18
Non clinical sample	14	0.39 (0.37-0.42)	0.97	0.42 (0.40-0.45)	0.95	0.30 (0.27-0.33)	0.80	0.18 (0.15-0.21)	0.75	0.60
Anxious	15	0.29 (0.26-0.32)	0.98	0.32 (0.29-0.35)	0.98	0.28 (0.25-0.31)	0.92	0.15 (0.12-0.18)	0.84	0.54
Avoidant	12	0.15 (0.12-0.18)	0.96	0.26 (0.23-0.29)	0.97	0.23 (0.19-0.25)	0.85	0.09 (0.06-0.12)	0.70	0.39
High quality	9	0.27 (0.24-0.30)	0.99	0.28 (0.24-0.31)	0.93	0.19 (0.15-0.22)	0.95	0.10 (0.07-0.12)	0.92	0.53
Low quality	12	0.32 (0.29-0.36)	0.98	0.39 (0.36-0.43)	0.97	0.36 (0.32-0.39)	0.65	0.21 (0.18-0.25)	0.51	0.58
Females only	15	0.26 (0.23-0.29)	0.98	0.35 (0.32-0.38)	0.98	0.29 (0.26-0.32)	0.93	0.17 (0.14-0.21)	0.83	0.59
Dysfunctional ER	5	0.26 (0.22-0.30)	0.99	0.26 (0.22-0.30)	0.98	0.17 (0.13-0.22)	0.97	0.10 (0.06-0.15)	0.95	0.59
Clinical	1	-0.64 (-0.70 - -0.57)	--	-0.37 (-0.46 - -0.27)	--	-0.35 (-0.44 - -0.25)	--	-0.24 (-0.34 - -0.13)	--	0.69
Non clinical	3	0.42 (0.37-0.46)	0.99	0.36 (0.31-0.40)	0.93	0.25 (0.21-0.30)	0.86	0.15 (0.11-0.20)	0.93	0.60
Depressive symptoms	2	0.47 (0.41-0.53)	0.80	0.51 (0.45-0.57)	0.70	0.33 (0.26-0.40)	0.73	0.24 (0.16-0.31)	0.64	0.73
Clinical	0	--	--	--	--	--	--	--	--	
Non clinical	2	0.47 (0.41-0.53)	0.80	0.51 (0.45-0.57)	0.70	0.33 (0.26-0.40)	0.73	0.24 (0.16-0.31)	0.64	0.73
Body dissatisfaction	4	0.35 (0.28-0.41)	0.42	0.49 0.43-0.54)	0.94	0.29 (0.22-0.36)	0.46	0.18 (0.10-0.25)	0.62	0.62
Clinical	2	0.28 (0.19-0.36)	0	0.30 (0.20-0.39)	0.80	0.31 (0.22-0.40)	0	0.08 (-0.02-0.18)	0	0.26
Non clinical	2	0.43 (0.34-0.52)	0	0.67 (0.60-0.72)	0	0.27 (0.17-0.37)	0.81	0.28 (0.18-0.38)	0	1.04
Neuroticism	2	0.72 (0.66-0.77)	0.99	0.45 (0.36-0.53)	0.43	0.52 (0.44-0.59)	0	0.28 (0.18-0.38)	0	0.54

	Nº of models	Path a (95% CI)	I^2	Path b (95% CI)	I^2	Path c (95%CI)	I^2	Path a*b (95%CI)	I^2	|a*b/c|
Clinical	0	--	--	--	--	--	--	--	--	
Non clinical	2	0.72 (0.66-0.77)	0.99	0.45 (0.36-0.53)	0.43	0.52 (0.44-0.59)	0	0.28 (0.18-0.38)	0	0.54
Perfectionism	3	0.36 (0.31-0.41)	0.92	0.38 (0.33-0.43)	0.71	0.27 (0.22-0.33)	0.81	0.14 (0.09-0.20)	0.72	0.52
Clinical	1	0.51 (0.43-0.58)	--	0.46 (0.38-0.53)	--	0.37 (0.28-0.45)	--	0.24 (0.15-0.33)	--	0.65
Non clinical	2	0.27 (0.20-0.34)	0.85	0.33 (0.26-0.39)	0	0.22 (0.15-0.29)	0.74	0.09 (0.02-0.16)	0	0.41
Mindfulness	2	-0.37 (-0.45--0.29)	0	-0.34 (-0.42--0.25)	0	0.27 (0.18-0.35)	0	0.12 (0.03-0.21)	0	0.44
Clinical	1	-0.33 (-0.55--0.07)	--	-0.46 (-0.64--0.22)	--	0.42 (0.31-0.52)	--	0.15 (-0.13-0.40)	--	0.36
Non clinical	1	-0.40 (-0.53--0.25)	--	-0.32 (-0.46--0.17)	--	0.37 (0.22-0.50)	--	0.13 (-0.03-0.29)	--	0.35
Social comparison	3	0.12 (0.03-0.20)	0.97	0.40 (0.33-0.47)	0.99	0.22 (0.14-0.29)	0.95	0.08 (-0.004-0.16)	0.86	0.36
Clinical	1	-0.49 (-0.61 - -0.34)	--	-0.53 (-0.65 - -0.39)	--	-0.30 (-0.45 - -0.13)	--	-0.26 (-0.42 - -0.09)	--	0.87
Non clinical	2	0.28 (0.19-0.36)	0	0.60 (0.54-0.66)	0.98	0.35 (0.26-0.42)	0	0.17 (0.08-0.26)	0.16	0.49

Appendix 10. Meta-analysis results for additional mediators (study 3)

Author/s (Year)/Country	Sample	Gender	Clinical vs. Non-clinical	IV	Mediator	DV	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Münch, Hunger & Schweitzer (2016)/Germany	253	1	0	Insecure	E	ED symptoms	-0,49	-0,47	0,53	0,23	3
Münch, Hunger & Schweitzer (2016)/Germany	253	1	0	Insecure	FF	ED symptoms	-0,61	-0,57	0,53	0,35	3
McDermott et al. (2015)/US	2644	1	0	Anxious	H	Eating problems	-0,27	-0,15	0,27	0,04	6
McDermott et al. (2015)/US	2644	1	0	Avoidant	H	Eating problems	-0,18	-0,15	0,08	0,03	6
Kiang & Harter (2006)/US	146	1	0	Anxious (mother)	EDPT	Eating behavioral problems	0,22	0,27	0,14	0,06	5
Kiang & Harter (2006)/US	146	1	0	Anxious (partner)	EDPT	Eating behavioral problems	0,23	0,27	0,31	0,06	5
Kiang & Harter (2006)/US	146	1	0	Avoidant(mother)	EDPT	Eating behavioral problems	0,35	0,27	0,12	0,1	5
De Paoli et al. (2017b)/Australia	122	2	1	Anxious	ARS	EDI-Drive for thinness	0,52	0,61	0,32	0,32	6
De Paoli et al. (2017b)/Australia	122	2	1	Anxious	ARS	EDI-Body dissatisfaction	0,52	0,69	0,43	0,36	6
De Paoli et al. (2017a)/Australia	508	1	0	Anxious	FA	ED symptoms	0,5	0,28	0,34	0,14	6
De Paoli et al. (2017a)/Australia	108	1	1	Anxious	FA	ED symptoms	0,6	0,46	0,4	0,28	6

Author/s (Year)/Country	Sample	Gender	Clinical vs. Non-clinical	IV	Mediator	DV	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Dakanalis et al. (2016)/Italy	2055	2	0	Anxious	Na	Bulimic symptoms	0,27	0,26	0,12	0,07	8
Dakanalis et al. (2016)/Italy	2055	2	0	Avoidant	Na	Dietary symptoms	0,29	0,29	0,12	0,08	8
Monteleone et al. (2018)/ Italy	123	1	2	Anxious	SP	EDI-Drive for thinness	0,39	0,42	0,28	0,16	5
Monteleone et al. (2018)/ Italy	123	1	2	Anxious	SP	EDI-Body dissatisfaction	0,41	0,34	0,22	0,14	5

Note. Gender: 0 = Males, 1 = Females, 2 = Both; Clinical = Coded as 1; Clinical and Non-Clinical = 2; IV = Insecure attachment style; Mediator:E = Extraversion; FF = Family Functioning; H = Hope; EDPT = Eating Disorder Psychological Traits; ARS = Appearance-based Rejection Sensitivity; FA = Fear of Abandonment; Na = Narcissism; SP = Sensitivity to Punishment; DV = Dependent variable; Path *a* = association between independent variable and mediator; Path *b* = association between mediator and dependent variable; Path *c* = total effect of the independent variable on the dependent variable; *a*b* = the indirect effect of the independent variable on the dependent variable controlling the mediator.

Appendix 11. Detailed extracted and coded data of studies not included in the meta-analysis (study 4)

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Aderka et al. (2009) Israel	102	Mixed	Non clinical	Adults	Other	Social anxiety severity	0.39	0.20	0.38	0.08	5
Bishop et al. (2018) US	251	Mixed	Non clinical	Adults	Anxious	Role balance	-0.36	-0.38	0.36	0.14	6
Bozanoglu et al. (2017) Turkey	374	Mixed	Non clinical	Chi/Ado	Other	Gap between experience and language	-0.66	0.2	-0.54	-0.13	5
Burnette et al. (2009) US	221	Mixed	Non clinical	Adults	Avoidant	Empathy (lack)	-0.31	-0.10	0.25	0.03	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adults	Avoidant	Forgivigness	-0.16	-0.44	0.25	0.07	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adults	Anxious	Forgivigness	-0.40	-0.44	0.52	0.18	3
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Vindictive	0.36	0.26	0.52	0.09	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Vindictive	0.28	0.26	0.37	0.07	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Cold	0.24	0.32	0.52	0.08	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Cold	0.56	0.32	0.37	0.18	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Socially Avoidant	0.32	0.36	0.52	0.12	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Socially Avoidant	0.34	0.36	0.37	0.12	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Nonassertive	0.31	0.28	0.52	0.09	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Avoidant	Nonassertive	0.19	0.28	0.37	0.05	5
Cooper-Newark (2015) UK Tesis	225	Mixed	Non clinical	Chi/Ado	Anxious	Exploitable	0.31	0.41	0.52	0.13	5
Cooper-Newark (2015) UK	225	Mixed	Non clinical	Chi/Ado	Avoidant	Exploitable	0.22	0.41	0.37	0.09	5

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Tesis Cooper-Newark (2015) UK	225	Mixed	Non clinical	Chi/Ado	Anxious	Overly Nurturant	0.42	0.53	0.52	0.22	5
Tesis Cooper-Newark (2015) UK	225	Mixed	Non clinical	Chi/Ado	Avoidant	Overly Nurturant	0.16	0.53	0.37	0.08	5
Tesis Cooper-Newark (2015) UK	225	Mixed	Non clinical	Chi/Ado	Anxious	Intrusive	0.24	0.18	0.52	0.04	5
Tesis Cooper-Newark (2015) UK	225	Mixed	Non clinical	Chi/Ado	Avoidant	Intrusive	-0.27	0.18	0.37	-0.05	5
Tesis Cooper-Newark (2015) UK	225	Mixed	Non clinical	Chi/Ado	Anxious	Domineering	0.24	0.23	0.52	0.06	5
Tesis Cooper-Newark (2015) UK	225	Mixed	Non clinical	Chi/Ado	Avoidant	Domineering	0.06	0.23	0.37	0.01	5
Felton & Jowett (2015) UK	241	Mixed	Non clinical	Adults	Avoidant	Need of thwarting sport	0.22	0.26	0.12	0.06	5
Felton & Jowett (2015) UK	241	Mixed	Non clinical	Adults	Anxious	Need of thwarting sport	0.32	0.26	0.11	0.08	5
Farinelli & Guerrero (2011) US	195	Mixed	Non clinical	Adults	Anxious	Overinvolved caregiving	0.22	0.19	0.23	0.04	4
Farinelli & Guerrero (2011) US	195	Mixed	Non clinical	Adults	Avoidant	Overinvolved caregiving	0.19	0.19	0.22	0.04	4
Gülum & Dag (2013) Turkey	661	Female	Non clinical	Adults	Anxiety	Locus of Control	0.27	0.29	0.38	0.08	3
Gülum & Dag (2013) Turkey	331	Male	Non clinical	Adults	Anxiety	Locus of Control	0.32	0.23	0.34	0.07	3
Gülum & Dag (2013) Turkey	661	Female	Non clinical	Adults	Avoidant	Locus of Control	0.12	0.29	0.09	0.03	3

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Gülum & Dag (2013) Turkey	331	Male	Non clinical	Adults	Avoidant	Locus of Control	0.16	0.23	0.14	0.04	3
Halpern et al. (2012) Canada	189	Mixed	Non clinical	Adults	Avoidant	Recovery from social withdrawal	0.36	0.28	0.43	0.1	2
Halpern et al. (2012) Canada	189	Mixed	Non clinical	Adults	Avoidant	Recovery from physical arousal	0.29	0.34	0.43	0.1	2
Hopkins et al. (2019) US	796	Mixed	Non clinical	Children	Other	Effortful Control	0.33	-0.23	-0.14	-0.08	9
Joeng et al. (2017) South Corea	473	Mixed	Non clinical	Adults	Avoidant	Fear of self compassion	0.46	0.45	0.5	0.21	5
Joeng et al. (2017) South Corea	473	Mixed	Non clinical	Adults	Anxious	Fear of self compassion	0.34	0.45	0.4	0.15	5
Keleher et al. (2010) US	163	Female	Non clinical	Adults	Anxious	Positive feelings about being a Lesbian	-0.2	-0.7	0.4	0.14	5
Keleher et al. (2010) US	163	Female	Non clinical	Adults	Avoidant	Positive feelings about being a Lesbian	-0.28	-0.7	0.29	0.2	5
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Observe	-0.08	0.11	-1.28	-0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Observe	0.33	0.13	0.07	0.04	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Observe	0.38	0.1	1.22	0.04	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Describe	0.93	0.05	-1.28	0.05	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Describe	0.03	0.02	0.07	0.001	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Describe	-0.5	0.03	1.22	-0.02	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Act with awareness	0.25	0.03	-1.28	0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Act with awareness	-0.05	0.05	0.07	-0.003	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Act with awareness	-0.28	0.034	1.22	-0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	No judgement	0.65	-0.15	-1.28	-0.1	6

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	No judgement	0.25	-0.16	0.07	-0.1	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	No judgement	-1	-0.13	1.22	0.13	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	No reactivity	0.25	0.02	-1.28	0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	No reactivity	0.28	-0.56	0.07	-0.16	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	No reactivity	-0.21	0.03	1.22	-0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Other	Decentering	0.84	-0.5	-1.28	-0.42	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Avoidant	Decentering	0.46	0.03	0.07	0.01	6
Linares et al. (2016) Spain	505	Mixed	Non clinical	Adults	Anxious	Decentering	-0.76	-0.5	1.22	0.38	6
Love & Murdock (2012) US	167	Mixed	Non clinical	Adults	Other	Trustworthiness	0.15	-0.19	-0.27	-0.03	5
Marchand-Reilly (2009) US	110	Mixed	Non clinical	Adults	Other	Attacking conflict behaviours	-0.34	0.2	-0.46	-0.07	4
Marchand-Reilly (2009) US	110	Mixed	Non clinical	Adults	Other	Attacking conflict behaviours	-0.24	0.22	-0.51	-0.05	4
Marchand-Reilly (2009) US	110	Mixed	Non clinical	Adults	Anxious	Attacking conflict behaviours	0.3	0.18	0.56	0.05	4
Marks et al. (2016) Australia	343	Mixed	Non clinical	Adults	Anxious	Emotional intelligence	-0.31	-0.43	0.43	0.13	5
Marks et al. (2016) Australia	343	Mixed	Non clinical	Adults	Avoidant	Emotional intelligence	-0.4	-0.43	0.26	0.17	5
Martin (2008) US Tesis	174	Male	Non clinical	Adults	Other	Complicated Grief (CG)	-0.06	0.26	-0.04	-0.02	5
Martin (2008) US Tesis	174	Male	Non clinical	Adults	Anxious	Complicated Grief (CG)	0.16	0.26	0.03	0.04	5
Martin (2008) US Tesis	174	Male	Non clinical	Adults	Avoidant	Complicated Grief (CG)	0.05	0.26	0.04	0.01	5
McDermott et al. (2015) US	2644	Mixed	Non clinical	Adults	Anxious	Hope	-0.27	-0.57	0.48	0.15	6
McDermott et al. (2015) US	2644	Mixed	Non clinical	Adults	Avoidant	Hope	-0.18	-0.57	0.34	0.1	6

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Mendes (2019) Portugal	91	Female	Non clinical	Adults	Other	Social safeness	-0.5	-0.49	-0.32	0.245	3
Milne & Greenway (2007) Australia	52	Female	Non clinical	Chi/Ado	Other	Separation-individuation process	-0.58	0.47	-0.7	-0.27	3
Milne & Greenway (2007) Australia	52	Female	Non clinical	Chi/Ado	Other	Introjective depression	-0.49	0.27	-0.71	-0.13	3
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Anxious	Contentment-Duration	-0.25	-0.14	0.27	0.04	5
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Avoidant	Contentment-Duration	0	-0.14	0.08	0	5
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Anxious	Contentment-Intensity	0.1	0.09	0.27	0.01	5
Ng & Hou (2017) China	284	Mixed	Non clinical	Adults	Avoidant	Contentment-Intensity	-0.05	0.09	0.08	-0.005	5
Nichols (2005) UK Tesis	147	Mixed	Non clinical	Adults	Anxious	Involuntary defeat strategy	0.19	0.76	0.17	0.14	5
Nichols (2005) UK Tesis	147	Mixed	Non clinical	Adults	Avoidant	Involuntary defeat strategy	0.22	0.76	0.2	0.17	5
Riggs et al. (2009) US	317	Mixed	Non clinical	Adults	Anxious	Chronic anxiety	0.2	0.76	0.52	0.15	6
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Mistrust/Maladaptive schemas	-0.56	0.53	-0.58	-0.3	5
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Social isolation/ Maladaptive Schemas	-0.48	0.57	-0.58	-0.27	5
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Social isolation/Maladaptive Schemas	0.53	0.57	0.48	0.3	5
Roelofs et al. (2011) Netherlands	222	Mixed	Non clinical	Chi/Ado	Other	Self-sacrifice/Maladapti	0.31	0.33	0.48	0.1	5

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Rosenthal et al. (2014) UK Tesis	104	Mixed	Non clinical	Adults	Anxious	ve Schemas Group identification	-0.19	-0.25	0.52	0.05	6
Rosenthal et al. (2014) UK	104	Mixed	Non clinical	Adults	Avoidant	Group identification	-0.23	-0.29	0.3	0.07	6
Shochet et al. (2008) Australia	153	Mixed	Non clinical	Chi/Ado	Other	School connectedness	0.47	-0.58	-0.53	-0.27	5
Smojver-Azic et al. (2015) Croatia	219	Mixed	Non clinical	Chi/Ado	Anxious	Emotional adjustment	-0.47	-0.29	0.3	0.14	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	Anxious	Agency	-0.23	-0.22	0.45	0.05	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	Avoidant	Agency	0	-0.22	0.21	0	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	anxious	Nurturance	0.22	-0.02	0.4	-0.004	5
Sudol (2005) US Tesis	206	Mixed	Non clinical	Adults	Avoidant	Nurturance	-0.46	-0.02	0.22	0.01	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Positive affect	-0.06	-0.02	0.47	0.001	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Positive affect	-0.17	-0.02	0.3	0.003	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Negative affect	0.01	0.1	0.47	0.001	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Negative affect	0.11	0.1	0.3	0.011	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Coherence	-0.16	-0.21	0.47	0.03	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Coherence	-0.34	-0.21	0.3	0.07	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Anxious	Emotional intensity	-0.06	-0.16	0.47	0.01	5
Sutin & Gillath (2009) US	454	Mixed	Non clinical	Adults	Avoidant	Emotional intensity	-0.32	-0.16	0.3	0.05	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Positive affect	-0.09	-0.03	0.44	0.003	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Positive affect	-0.12	-0.03	0.26	0.004	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Negative affect	0.2	0.18	0.44	0.036	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Negative affect	0.1	0.18	0.26	0.018	5

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Coherence	-0.09	-0.27	0.44	0.024	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Coherence	-0.25	-0.27	0.26	0.07	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Anxious	Emotional intensity	0.12	0.01	0.44	0.001	5
Sutin & Gillath (2009) US	534	Mixed	Non clinical	Adults	Avoidant	Emotional intensity	-0.19	0.01	0.26	-0.002	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adults	Other	Self-Knowledge	-0.60	-0.20	0.48	0.12	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adults	Other	Mindfulness	-0.47	-0.01	0.48	0.01	5
Wang (2007) China Tesis	480	Mixed	Non clinical	Chi/Ado	Avoidant	Filial piety: concerned about parents or elderly (reciprocral)	-0.58	-0.08	0.05	0.05	6
Wang (2007) China Tesis	480	Mixed	Non clinical	Chi/Ado	Anxiety	Filial piety:live with parent or parent in law after marriage (autoritarian)	0.15	0.04	0.14	0.01	6
Wei et al. (2005c) US	308	Mixed	Non clinical	Adults	Anxious	Loneliness	0.55	0.59	0.26	0.3245	5
Wei et al. (2005c) US	308	Mixed	Non clinical	Adults	Avoidant	Loneliness	0.35	0.59	0.01	0.2065	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adults	Anxious	Self-reinforcement	0.62	0.6	0.56	0.37	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adults	Avoidant	Self-reinforcement	0.21	0.6	0.31	0.13	5
Wei et al. (2005a) US	299	Mixed	Non clinical	Adults	Anxious	Basic Psychological Needs Satisfaction	-0.43	-0.64	0.64	0.28	7
Wei et al. (2005a) US	299	Mixed	Non clinical	Adults	Avoidant	Basic Psychological Needs Satisfaction	-0.32	-0.64	0.3	0.2	7
Wei et al. (2007) US	390	Mixed	Non clinical	Adults	Anxious	Self-defeating	0.38	0.22	0.4	0.08	5

Author/s (Year)/ Country	Sample	Gender	Clinical vs. Non-clinical	Developmental stage	Insecure attachment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
						patterns					
Wei et al. (2007) US	390	Mixed	Non clinical	Adults	Avoidant	Self-defeating patterns	0.39	0.22	0.2	0.09	5
Zakalik & Wei (2006) US	234	Male	Non clinical	Adults	Anxious	Perceived discrimination	0.5	0.23	0.63	0.12	6
Zakalik & Wei (2006) US	234	Male	Non clinical	Adults	Avoidant	Perceived discrimination	-0.15	0.23	0.32	-0.03	6

Appendix 12. Detailed extracted and coded data for meta-analysis (study 4)

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Altin & Terzi (2010) Turkey	146	Mixed	Non clinical	Adult	Other	Dependence	0.20	0.15	0.17	0.03	4
Altin & Terzi (2010) Turkey	146	Mixed	Non clinical	Adult	Other	Relational satisfaction	0.35	-0.26	-0.26	-0.09	4
Besser & Priel (2008) Israel	113	Mixed	Non clinical	Adult	Other	Dependence	-0.29	0.50	-0.25	-0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.47	0.31	0.42	0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.59	0.38	0.33	0.22	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Avoidant	Repetitive thinking	0.47	0.31	0.42	0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Anxious	Repetitive thinking	0.59	0.38	0.33	0.22	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Avoidant	Brooding rumination	0.47	0.31	0.42	0.15	5
Beyderman & Young (2016) UK	100	Mixed	Clinical	Adult	Anxious	Brooding rumination	0.59	0.38	0.33	0.22	5
Boo (2010) US Tesis	218	Mixed	Non clinical	Adult	Other	Low self-esteem	0.83	-0.75	-0.62	-0.62	5
Bosacki et al. (2007)	7290	Mixed	Non clinical	Chi/Ado	Other	Low self-	-0.11	-0.24	0.11	0.03	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Canada						esteem					
Bosacki et al. (2007) Canada	7290	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	0.10	-0.29	-0.06	-0.03	6
Brenning et al. (2012) Belgium	339	Mixed	Non clinical	Chi/Ado	Anxious	Emotional dysregulation	0.49	0.16	0.42	0.08	5
Brenning et al. (2012) Belgium	339	Mixed	Non clinical	Chi/Ado	Avoidant	Emotional dysregulation	0.25	0.13	0.26	0.03	5
Brenning et al. (2012) Belgium	746	Mixed	Non clinical	Chi/Ado	Anxious	Emotional dysregulation	0.46	0.24	0.37	0.11	5
Brenning et al. (2012) Belgium	746	Mixed	Non clinical	Chi/Ado	Avoidant	Emotional dysregulation	0.22	0.22	0.39	0.48	5
Burnette et al. (2009) US	221	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.40	0.44	0.52	0.18	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adult	Anxious	Repetitive thinking	0.40	0.44	0.52	0.18	3
Burnette et al. (2009) US	221	Mixed	Non clinical	Adult	Anxious	Reflection rumination	0.40	0.44	0.52	0.18	3
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Anxious	Self-criticism	0.44	0.56	0.42	0.25	5
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Avoidant	Self-criticism	0.23	0.56	0.24	0.13	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Anxious	Dependence	0.65	0.28	0.42	0.18	5
Cantazaro & Wei (2010) US	424	Mixed	Non clinical	Adult	Avoidant	Dependence	-0.35	0.28	0.24	-0.10	5
Chaowiang (2008) US Tesis	950	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.36	0.4	-0.14	-0.14	5
Chaowiang (2008) US Tesis	950	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.4	0.04	-0.14	-0.02	5
Chaowiang (2008) US Tesis	950	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.49	0.03	-0.2	-0.01	5
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Emotional dysregulation	-0.12	0.17	-0.40	-0.02	7
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Emotional dysregulation	-0.11	0.17	-0.37	-0.02	7
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.25	-0.26	-0.40	-0.07	7
Chen et al. (2018)/China	1955	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.25	-0.26	-0.37	-0.07	7
Chi Kuan Mak (2010)	150	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.61	-0.34	0.26	0.2074	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Hong kong Chi Kuan Mak (2010) Hong kong	150	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.34	-0.34	0.45	0.1156	5
Chi Kuan Mak (2010) US	209	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.29	-0.23	0.22	0.0667	5
Chi Kuan Mak (2010) US	209	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.2	-0.23	0.40	0.046	5
Chi Kuan Mak & Bond (2010) China	150	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.24	-0.27	0.45	0.06	5
Chi Kuan Mak & Bond (2010) China	150	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.69	-0.27	0.26	0.19	5
Chi Kuan Mak & Bond (2010) US	209	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.15	-0.17	0.4	0.03	5
Chi Kuan Mak & Bond (2010) US	209	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.33	-0.17	0.22	0.06	5
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Avoidant	Emotional dysregulation	-0.39	-0.22	0.23	0.09	6
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Anxious	Emotional dysregulation	-0.42	-0.22	0.32	0.09	6
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Avoidant	Relational satisfaction	-0.32	-0.33	0.23	0.11	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Clout & Brown (2016) Australia	105	Female	Non clinical	Adult	Anxious	Relational satisfaction	-0.29	-0.33	0.32	0.10	6
Cohen et al. (2013) China	1150	Mixed	Non clinical	Chi/Ado	Other	Interpersonal stressors	0.24	0.09	0.28	0.02	7
Cooley et al. (2010) US	93	Female	Non clinical	Adult	Other	Coping: behavioral hyperactivating strategies	0.27	-0.2	-0.38	-0.05	4
Cruddas et al. (2012) UK	92	Mixed	Non clinical	Adult	Other	Self disclosure	-0.65	0.55	-0.27	-0.36	3
Dagnino et al. (2017) Chile	70	Mixed	Clinical	Adult	Anxious	Self-criticism	0.51	0.47	0.19	0.24	5
Dagnino et al. (2017) Chile	70	Mixed	Clinical	Adult	Avoidant	Self-criticism	0.31	0.47	0.23	0.15	5
Dagnino et al. (2017) Chile	70	Mixed	Non clinical+clinical	Adult	Anxious	Dependence	0.52	0.06	0.19	0.031	5
Dagnino et al. (2017) Chile	70	Mixed	Non clinical+clinical	Adult	Avoidant	Dependence	0.07	0.03	0.23	0.002	5
Eberhart & Hammen (2010) US	104	Female	Non clinical	Adult	Anxious	Relational conflict	0.3	0.37	0.37	0.11	6
Eberhart & Hammen (2010) US	104	Female	Non clinical	Adult	Avoidant	Relational conflict	0.15	0.37	0.15	0.06	6
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	0.13	-0.14	-0.30	-0.02	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	0.22	0.03	-0.30	0.01	6
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: deactivating strategies	0.13	0.04	-0.30	0.01	6
Gaylord-Harden et al. (2009) US	393	Mixed	Non clinical	Chi/Ado	Other	Coping: deactivating strategies	0.15	-0.05	-0.30	-0.01	6
Gnilka et al. (2013) US	180	Mixed	Non clinical	Adult	Avoidant	Maladaptative perfectionism	0.22	0.28	0.18	0.06	5
Gnilka et al. (2013) US	180	Mixed	Non clinical	Adult	Anxious	Maladaptative perfectionism	0.33	0.2	0.38	0.07	5
Graham (2018) UK Tesis	53	Mixed	Clinical	Chi/Ado	Other	Low self-esteem	0.22	-0.44	-0.39	-0.10	5
Graham (2018) UK Tesis	53	Mixed	Clinical	Chi/Ado	Other	Self-compasion	0.15	-0.51	-0.39	-0.0765	5
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.4	0.47	0.38	0.19	3
Gülum & Dag	294	Male	Non clinical	Adult	Anxious	Coping:	0.38	0.39	0.34	0.15	3

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
(2013) Turkey						cognitive hyperactivating strategies					
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.05	0.47	0.09	0.02	3
Gülum & Dag (2013) Turkey	294	Male	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.02	0.39	0.14	0.008	3
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Anxious	Repetitive thinking	0.4	0.47	0.38	0.19	3
Gülum & Dag (2013) Turkey	294	Male	Non clinical	Adult	Anxious	Repetitive thinking	0.38	0.39	0.34	0.15	3
Gülum & Dag (2013) Turkey	581	Female	Non clinical	Adult	Avoidant	Repetitive thinking	0.05	0.47	0.09	0.02	3
Gülum & Dag (2013) Turkey	294	Male	Non clinical	Adult	Avoidant	Repetitive thinking	0.02	0.39	0.14	0.008	3
Han & Lee (2011) US	134	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.23	-0.3	-0.38	-0.07	4
Han & Lee (2011) US	134	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.11	-0.3	-0.29	-0.03	4
Hankin et al. (2005) US	202	Mixed	Non clinical	Adult	Anxious	Dysfuntional attitudes	0.39	0.23	0.15	0.09	6
Hankin et al. (2005) US	202	Mixed	Non clinical	Adult	Avoidant	Dysfuntional attitudes	0.31	0.23	0.27	0.07	6
Hankin et al.	202	Mixed	Non clinical	Adult	Anxious	Low self-	-0.43	-0.59	0.33	0.25	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
(2005) US						esteem					
Hankin et al. (2005) US	202	Mixed	Non clinical	Adult	Avoidant	Low self-esteem	-0.32	-0.59	0.33	0.19	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Anxious	Interpersonal stressors	0.3	0.41	0.24	0.12	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Avoidant	Interpersonal stressors	0.22	0.41	0.13	0.09	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Anxious	Interpersonal stressors	0.05	0.2	0.24	0.01	6
Hankin et al. (2005) US	233	Mixed	Non clinical	Adult	Avoidant	Interpersonal stressors	0.09	0.2	0.13	0.02	6
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.08	0.05	-0.36	-0.004	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Avoidant	Dependence	0.12	0.05	0.34	0.006	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Dependence	0.33	0.05	0.35	0.017	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Social comparison	-0.03	-0.29	-0.36	0.009	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Avoidant	Social comparison	-0.3	-0.29	0.34	0.09	4
Irons & Gilbert (2005) UK	140	Mixed	Non clinical	Chi/Ado	Other	Social comparison	-0.25	-0.29	0.35	0.07	4
Joeng et al. (2017) South	473	Mixed	Non clinical	Adult	Avoidant	Self-compasion	-0.3	-0.49	0.37	0.15	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Corea											
Joeng et al. (2017) South Corea	473	Mixed	Non clinical	Adult	Anxious	Self-compasion	-0.24	-0.49	0.25	0.12	5
Kamkar et al. (2012) Canada	140	Mixed	Non clinical	Chi/Ado	Anxious	Dysfuntional attitudes	0.3	0.41	0.33	0.12	5
Kamkar et al. (2012) Canada	87	Female	Non clinical	Chi/Ado	Anxious	Low self-esteem	-0.29	-0.55	0.33	0.16	5
Kang et al. (2014) UK	254	Female	Non clinical	Adult	Other	Low self-esteem	-0.24	-0.6	0.15	0.14	5
Kang et al. (2014) UK	254	Female	Non clinical	Adult	Other	Low self-esteem	-0.34	-0.55	0.31	0.19	5
Keleher et al. (2010) US	163	Female	Non clinical	Adult	Anxious	Perceived social support	-0.37	-0.41	0.4	0.15	5
Keleher et al. (2010) US	163	Female	Non clinical	Adult	Avoidant	Perceived social support	-0.1	-0.41	0.29	0.04	5
Kenney (2006) US Tesis	2625	Female	Non clinical	Chi/Ado	Other	Low self-esteem	0.4	-0.51	-0.32	-0.2	5
Kenney (2006) US Tesis	2625	Female	Non clinical	Chi/Ado	Other	Low self-esteem	0.39	-0.51	-0.32	-0.2	5
Kenney (2006) US Tesis	2440	Male	Non clinical	Chi/Ado	Other	Low self-esteem	0.37	-0.5	-0.24	-0.19	5
Kenney (2006) US Tesis	2440	Male	Non clinical	Chi/Ado	Other	Low self-esteem	0.39	-0.5	-0.31	-0.2	5
Kenny &	81	Mixed	Non clinical	Adult	Other	Low self-	0.46	-0.48	-0.34	-0.22	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Sirin (2006) US						esteem					
Kenny et al. (1993) US	92	Female	Non clinical	Chi/Ado	Other	Low self-esteem	0.49	-0.77	-0.47	-0.37	5
Kenny et al. (1993) US	115	Male	Non clinical	Chi/Ado	Other	Low self-esteem	0.64	-0.73	-0.62	-0.47	5
Korolly (2017) US Tesis	157	Mixed	Non clinical	Adult	Anxious	Dependence	0.01	-0.05	0.49	0.000	6
Korolly (2017) US Tesis	155	Mixed	Non clinical	Adult	Anxious	Dependence	0.16	0.24	0.50	0.039	6
Korolly (2017) US Tesis	67	Mixed	Non clinical	Adult	Anxious	Dependence	0.36	-0.31	0.54	-0.112	6
Kullik & Petermann (2013) Germany	127	Female	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	-0.22	0.14	-0.27	-0.03	6
Kullik & Petermann (2013) Germany	127	Female	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	-0.13	0.14	-0.31	-0.02	6
Kullik & Petermann (2013) Germany	121	Male	Non clinical	Chi/Ado	Other	Coping: behavioral hyperactivating strategies	-0.29	0.25	-0.33	-0.07	6
Kullik &	127	Female	Non clinical	Chi/Ado	Other	Coping:	-0.26	0.41	-0.27	-0.1	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Petermann (2013) Germany						cognitive hyperactivating strategies					
Kullik & Petermann (2013) Germany	127	Female	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.25	0.41	-0.31	-0.1	6
Kullik & Petermann (2013) Germany	121	Male	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.24	0.36	-0.33	-0.08	6
Land (2012) US Tesis	120	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.37	0.63	0.33	0.23	4
Land (2012) US Tesis	120	Mixed	Non clinical	Adult	Anxious	Repetitive thinking	0.37	0.63	0.33	0.23	4
Land (2012) US Tesis	120	Mixed	Non clinical	Adult	Anxious	Brooding rumination	0.37	0.63	0.33	0.23	4
Leal (2018) Mexico Tesis	235	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.18	-0.22	0.36	0.04	5
Leal (2018) Mexico Tesis	235	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.17	-0.22	0.28	0.04	5
Leal (2018) Mexico Tesis	360	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.21	-0.09	0.38	0.02	5
Leal (2018) Mexico Tesis	360	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.32	-0.09	0.23	0.03	5
Lecompte et al. (2014)	68	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	-0.55	-0.51	0.55	0.28	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Canada											
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Anxious	Low self-esteem	0.46	-0.57	0.46	-0.26	8
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Avoidant	Low self-esteem	-0.38	-0.57	0.42	0.22	8
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Anxious	Dysfuntional attitudes	0.31	0.23	0.12	0.07	8
Lee & Hankin (2009) US	350	Mixed	Non clinical	Chi/Ado	Avoidant	Dysfuntional attitudes	0.32	0.23	0.15	0.07	8
Lee & Koo (2015) Korea	176	Mixed	Non clinical	Adult	Other	Low self-esteem	-0.37	-0.58	0.32	0.21	5
Lee & Koo (2015) Korea	176	Mixed	Non clinical	Adult	Other	Low self-esteem	-0.41	-0.58	0.35	0.24	5
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.28	-0.06	-0.1	-0.02	6
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.2	-0.06	-0.11	-0.01	6
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.28	-0.06	-0.1	-0.02	6
Li et al. (2015) China	1305	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.2	-0.06	-0.11	-0.01	6
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating	0.22	-0.05	-0.07	-0.01	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
						strategies					
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.19	-0.05	-0.06	-0.01	6
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.22	-0.05	-0.07	-0.01	6
Li et al. (2015) China & Italy	2632	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.19	-0.05	-0.06	-0.01	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.19	-0.03	-0.06	-0.006	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.23	-0.03	-0.19	-0.007	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.19	-0.03	-0.06	-0.006	6
Li et al. (2015) Italy	1327	Mixed	Non clinical	Chi/Ado	Other	Self-control	0.23	-0.03	-0.19	-0.007	6
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.01	0.11	-0.23	-0.002	5
Lindsay (2007) US	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive	-0.04	0.11	-0.04	-0.02	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Tesis						hyperactivating strategies					
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.34	0.11	-0.44	-0.04	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.04	0.11	-0.09	-0.006	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.22	0.32	-0.23	-0.07	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.02	0.32	-0.04	-0.009	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.2	0.32	-0.44	-0.06	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivat	-0.04	0.32	-0.09	0.01	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
						ing strategies					
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.01	0.11	-0.23	-0.002	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.04	0.11	-0.04	-0.02	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.34	0.11	-0.44	-0.04	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.04	0.11	-0.09	-0.006	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.22	0.32	-0.23	-0.07	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.02	0.32	-0.04	-0.009	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.2	0.32	-0.44	-0.06	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.04	0.32	-0.09	0.01	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Brooding rumination	-0.01	0.11	-0.23	-0.002	5
Lindsay (2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Brooding rumination	-0.04	0.11	-0.04	-0.02	5
Lindsay	117	Mixed	Non clinical	Chi/Ado	Other	Brooding	-0.34	0.11	-0.44	-0.04	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
(2007) US Tesis Lindsay						rumination					
(2007) US Tesis Lindsay	117	Mixed	Non clinical	Chi/Ado	Other	Brooding rumination	-0.04	0.11	-0.09	-0.006	5
(2007) US Tesis Lindsay	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.22	0.32	-0.23	-0.07	5
(2007) US Tesis Lindsay	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.02	0.32	-0.04	-0.009	5
(2007) US Tesis Lindsay	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.2	0.32	-0.44	-0.06	5
(2007) US Tesis	117	Mixed	Non clinical	Chi/Ado	Other	Reflection rumination	-0.04	0.32	-0.09	0.01	5
Liu (2006) Taiwan	522	Female	Non clinical	Chi/Ado	Other	Perceived social support	-0.12	0.18	-0.19	-0.02	5
Liu (2006) Taiwan	522	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.12	-0.36	0.19	-0.04	5
Liu (2006) Taiwan	522	Female	Non clinical	Chi/Ado	Other	Perceived social support	-0.11	0.18	0.19	-0.02	5
Liu (2006) Taiwan	622	Male	Non clinical	Chi/Ado	Other	Perceived social support	-0.14	0.12	0.19	-0.02	5
Liu (2006) Taiwan	622	Male	Non clinical	Chi/Ado	Other	Perceived social	-0.09	0.12	0.19	-0.01	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
						support					
Liu (2006) Taiwan	622	Male	Non clinical	Chi/Ado	Other	Perceived social support	-0.1	-0.39	0.19	0.04	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	-0.34	-0.36	0.14	0.12	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	-0.51	-0.36	0.38	0.18	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Avoidant	Coping: deactivating strategies	-0.34	-0.42	0.14	0.14	5
Lopez et al. (2001) US	55	Mixed	Non clinical	Adult	Anxious	Coping: deactivating strategies	-0.2	-0.42	0.38	0.08	5
Love & Murdock (2012) US	167	Mixed	Non clinical	Adult	Other	Low self-esteem	0.38	-0.47	-0.27	-0.18	5
Marganska et al. (2013) US	284	Mixed	Non clinical	Adult	Other	Emotional dysregulation	-0.19	0.42	-0.27	-0.08	5
Marganska et al. (2013) US	284	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.35	0.42	0.31	0.15	5
Marganska et al. (2013) US	284	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.25	0.42	0.25	0.11	5
Marganska et	284	Mixed	Non clinical	Adult	Other	Emotional	-0.03	0.42	0.1	-0.01	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
al. (2013) US						dysregulation					
Margolese et al. (2005) Canada	88	Female	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.25	0.56	-0.27	-0.14	5
Margolese et al. (2005) Canada	88	Female	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.24	0.56	-0.28	-0.13	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	-0.36	0.25	-0.27	-0.09	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Dysfuntional attitudes	0.09	0.25	0.15	0.02	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.32	0.19	-0.27	-0.06	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.28	0.19	0.15	0.05	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.32	0.19	-0.27	-0.06	5
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	0.28	0.19	0.15	0.05	5
Margolese et	134	Mixed	Non clinical	Chi/Ado	Other	Rumination	-0.32	0.19	-0.27	-0.06	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
al. (2005) Canada											
Margolese et al. (2005) Canada	134	Mixed	Non clinical	Chi/Ado	Other	Rumination	0.28	0.19	0.15	0.05	5
Martin (2001) US Tesis	112	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	1.00	0.50	0.90	0.50	6
Martin (2001) US Tesis	112	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	0.40	0.50	0.30	0.20	6
Martin (2001) US Tesis	112	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	0.20	0.50	0.20	0.10	6
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Anxious	Coping: behavioral hyperactivating strategies	-0.13	-0.21	0.6	0.0273	5
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: behavioral hyperactivating strategies	-0.31	-0.21	0.54	0.0651	5
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Anxious	Coping: behavioral hyperactivating strategies	-0.39	-0.43	0.6	0.1677	5
Merlo (2005) US Tesis	150	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: behavioral hyperactivating strategies	-0.64	-0.43	0.54	0.2752	5
Mohammadkhani et al.	175	Mixed	Non clinical	Adult	Other	Coping: cognitive	0.35	0.50	0.43	0.18	3

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
(2018) Iran						hyperactivating strategies					
Mohammadkhani et al. (2018) Iran	175	Mixed	Non clinical	Adult	Other	Repetitive thinking	0.35	0.50	0.43	0.18	3
Mohammadkhani et al. (2018) Iran	175	Mixed	Non clinical	Adult	Other	Brooding rumination	0.35	0.50	0.43	0.18	3
Monti & Rudolph (2014) US	417	Female	Non clinical	Adult	Anxious	Alexithimia	0	-0.28	0.1	0	7
Monti & Rudolph (2014) US	417	Female	Non clinical	Adult	Avoidant	Alexithimia	-0.25	-0.28	0.01	0.07	7
Owens et al. (2018) US	336	Mixed	Non clinical	Adult	Avoidant	Alexithimia	0.28	0.21	0.21	0.06	6
Owens et al. (2018)/US	336	Mixed	Non clinical	Adult	Anxious	Emotional dysregulation	0.33	0.67	0.46	0.22	6
Owens et al. (2018)/US	336	Mixed	Non clinical	Adult	Avoidant	Emotional dysregulation	0.18	0.72	0.21	0.13	6
Paech et al. (2015) Germany	343	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.31	-0.17	0.27	0.05	5
Paech et al. (2015) Germany	343	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.51	-0.17	0.03	0.09	5
Paech et al. (2015)	343	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.39	-0.46	0.4	0.18	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Germany											
Paech et al. (2015) Germany	343	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.24	-0.46	0.05	0.11	5
Permuy et al. (2010) Spain	164	Mixed	Non clinical	Adult	Other	Self-criticism	0.45	0.2	0.28	0.09	4
Permuy et al. (2010) Spain	164	Mixed	Non clinical	Adult	Other	Dependence	0.48	0.27	0.25	0.13	4
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	-0.27	0.66	-0.26	-0.18	5
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.35	0.66	0.37	0.23	5
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	-0.19	0.66	-0.13	-0.13	5
Pickard et al. (2016) Australia	151	Mixed	Non clinical	Adult	Other	Emotional dysregulation	0.48	0.66	0.42	0.32	5
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.23	0.41	-0.6	-0.1	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.29	0.41	-0.45	-0.11	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Dependence	-0.37	0.41	-0.42	-0.15	4
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Social comparison	0.26	-0.37	-0.3	-0.1	4
Puissant et al.	225	Mixed	Non clinical	Chi/Ado	Avoidant	Social	-0.11	-0.37	0.19	0.04	4

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
(2011) Belgium						comparison					
Puissant et al. (2011) Belgium	225	Mixed	Non clinical	Chi/Ado	Other	Social comparison	-0.28	-0.37	0.38	0.1	4
Reinecke & Rogers (2001) US	54	Mixed	Clinical	Adult	Other	Dysfuntional attitudes	0.71	0.28	0.41	0.20	5
Reis & Grenyer (2002) Australia	245	Mixed	Non clinical	Adult	Other	Maladaptative perfectionism	0.27	0.29	0.34	0.08	5
Reis & Grenyer (2002) Australia	245	Mixed	Non clinical	Adult	Other	Maladaptative perfectionism	0.17	0.33	0.53	0.06	5
Reis & Grenyer (2002) Australia	245	Mixed	Non clinical	Adult	Other	Maladaptative perfectionism	0.44	0.49	0.53	0.22	5
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Anxious	Dysfuntional attitudes	0.21	0.35	0.22	0.07	4
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	-0.14	0.35	-0.22	-0.05	4
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Anxious	Low self-esteem	-0.36	-0.49	0.22	0.18	4
Roberts et al. (1996) US	255	Mixed	Non clinical	Adult	Other	Low self-esteem	0.3	-0.49	-0.22	-0.15	4
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Self-criticism	0.39	0.57	0.36	0.22	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Self-criticism	0.19	0.57	0.36	0.11	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Self-criticism	0.38	0.57	0.36	0.22	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Self-criticism	0.31	0.57	0.36	0.18	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Self-compasion	-0.38	-0.53	0.36	0.2	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Self-compasion	-0.26	-0.53	0.36	0.14	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.32	0.43	0.36	0.14	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.6	0.43	0.36	0.26	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Anxious	Repetitive thinking	0.32	0.43	0.36	0.14	6
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Repetitive thinking	0.6	0.43	0.36	0.26	6
RosenMarsch (2013) UK	356	Mixed	Non clinical	Adult	Anxious	Brooding rumination	0.32	0.43	0.36	0.14	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Tesis											
RosenMarsch (2013) UK Tesis	356	Mixed	Non clinical	Adult	Avoidant	Brooding rumination	0.6	0.43	0.36	0.26	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	-0.19	0.49	-0.36	-0.1	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.41	0.49	0.33	0.2	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Coping: cognitive hyperactivating strategies	0.16	0.49	0.15	0.08	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	0.16	0.49	0.15	0.08	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	-0.19	0.49	-0.36	-0.1	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Repetitive thinking	0.41	0.49	0.33	0.2	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Rumination	-0.19	0.49	-0.36	-0.1	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Rumination	0.41	0.49	0.33	0.2	6
Ruitjen et al. (2011) Netherlands	455	Mixed	Non clinical	Chi/Ado	Other	Rumination	0.16	0.49	0.15	0.08	6
Safford et al. (2004) US	167	Mixed	Non clinical	Adult	Other	Dysfuntional attitudes	-0.2	0.29	-0.49	-0.06	5
Şenkal & Işikli (2015) Turkey	417	Mixed	Non clinical	Adult	Anxious	Alexithimia	0.33	0.29	0.34	0.1	5
Shaver et al. (2005) US	61	Female	Non clinical	Adult	Anxious	Relational satisfaction	-0.21	-0.11	0.67	0.02	4
Shaver et al. (2005) US	61	Male	Non clinical	Adult	Anxious	Relational satisfaction	-0.18	-0.18	0.31	0.03	4
Silverman (2003) Canada Tesis	451	Mixed	Non clinical	Chi/Ado	Other	Perceived social support	-0.59	-0.53	0.49	0.31	7
Smagur (2018) US Tesis	301	Female	Non clinical	Adult	Other	Dysfuntional attitudes	0.48	0.39	0.58	0.19	7
Suzuki & Tomoda (2015) Japan	342	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	0.3	-0.49	-0.32	-0.15	7
Suzuki & Tomoda (2015) Japan	342	Mixed	Non clinical	Chi/Ado	Other	Low self-esteem	-0.47	-0.49	0.4	0.23	7
Suzuki & Tomoda (2015) Japan	342	Mixed	Non clinical	Chi/Ado	Avoidant	Low self-esteem	-0.13	-0.49	0.23	0.06	7
Vahedi et al. (2016) Iran	285	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivat	-0.13	-0.21	0.31	0.03	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
						ing strategies					
Vahedi et al. (2016) Iran	285	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	0.35	0.42	0.25	0.15	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adult	Other	Self-compasion	-0.49	-0.33	0.48	0.16	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adult	Other	Coping: cognitive hyperactivating strategies	-0.44	-0.10	0.48	0.04	5
Valikhani et al. (2018) Iran	400	Mixed	Non clinical	Adult	Other	Self-control	-0.44	-0.10	0.48	0.04	5
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Anxious	Coping: cognitive hyperactivating strategies	0.31	0.52	0.35	0.16	7
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: cognitive hyperactivating strategies	0.01	0.52	0.26	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Coping: cognitive hyperactivating strategies	0.22	0.39	0.48	0.09	7

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: cognitive hyperactivating strategies	0.02	0.39	0.18	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Coping: cognitive hyperactivating strategies	0.25	0.44	0.48	0.11	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Coping: cognitive hyperactivating strategies	0.03	0.44	0.18	0.01	7
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Anxious	Repetitive thinking	0.31	0.52	0.35	0.16	7
Van de Walle et al. (2016) Belgium	390	Mixed	Non clinical	Chi/Ado	Avoidant	Repetitive thinking	0.01	0.52	0.26	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Repetitive thinking	0.22	0.39	0.48	0.09	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Repetitive thinking	0.02	0.39	0.18	0.01	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Anxious	Repetitive thinking	0.25	0.44	0.48	0.11	7
Van de Walle et al. (2016) Belgium	172	Mixed	Non clinical	Chi/Ado	Avoidant	Repetitive thinking	0.03	0.44	0.18	0.01	7

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.33	-0.33	-0.7	-0.11	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.5	-0.63	-0.7	-0.32	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.33	-0.38	-0.7	-0.16	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.33	-0.33	-0.58	-0.11	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.53	-0.63	-0.58	-0.33	3
Webster (2000) US Tesis	85	Female	Non clinical	Chi/Ado	Other	Perceived social support	0.27	-0.38	-0.58	-0.1	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.05	-0.07	-0.35	-0.003	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.12	-0.46	-0.35	-0.06	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.08	-0.36	-0.35	-0.03	3
Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	Perceived social support	0.14	-0.07	-0.27	-0.009	3
Webster	78	Male	Non clinical	Chi/Ado	Other	Perceived	0.28	-0.46	-0.27	-0.12	3

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
(2000) US Tesis Webster (2000) US Tesis	78	Male	Non clinical	Chi/Ado	Other	social support Perceived social support	0.08	-0.36	-0.27	-0.03	3
Wei (2006) US	372	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	-0.05	0.32	0.69	-0.016	7
Wei (2006) US	372	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivating strategies	-0.03	0.32	0.69	-0.0096	7
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Anxious	Coping: behavioral hyperactivating strategies	0.25	0.29	0.29	0.07	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Avoidant	Coping: behavioral hyperactivating strategies	0.18	0.29	0.32	0.05	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Anxious	Coping: cognitive hyperactivating strategies	0.42	0.4	0.29	0.17	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Avoidant	Coping: cognitive hyperactivat	0.26	0.4	0.32	0.1	5

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
						ing strategies					
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Anxious	Coping: deactivating strategies	0.33	0.44	0.29	0.15	5
Wei et al. (2003) US	515	Mixed	Non clinical	Adult	Avoidant	Coping: deactivating strategies	0.32	0.44	0.32	0.14	5
Wei et al. (2004) US	310	Mixed	Non clinical	Adult	Anxious	Maladaptati ve perfectionis m	0.49	0.58	0.49	0.28	5
Wei et al. (2004) US	310	Mixed	Non clinical	Adult	Avoidant	Maladaptati ve perfectionis m	0.28	0.58	0.18	0.16	5
Wei et al. (2005) US	308	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	-0.37	-0.27	0.26	0.1	5
Wei et al. (2005) US	308	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	-0.21	-0.27	0.1	0.06	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adult	Anxious	Dependence	-0.52	-0.68	0.56	0.35	5
Wei et al. (2005b) US	425	Mixed	Non clinical	Adult	Avoidant	Dependence	-0.36	-0.68	0.31	0.24	5
Wei et al. (2005c) US	308	Mixed	Non clinical	Adult	Anxious	Self disclosure	-0.16	-0.27	0.26	0.04	5
Wei et al. (2005c) US	308	Mixed	Non clinical	Adult	Avoidant	Self disclosure	-0.4	-0.27	0.1	0.11	5
Wei et al. (2006) US	372	Mixed	Non clinical	Adult	Anxious	Maladaptati ve perfectionis	0.11	0.23	0.43	0.03	7

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Wei et al. (2006) US	372	Mixed	Non clinical	Adult	Avoidant	Maladaptative perfectionism	0.13	0.23	0.11	0.03	7
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Anxious	Low self-esteem	-0.38	-0.66	0.4	0.25	5
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Avoidant	Low self-esteem	-0.28	-0.66	0.2	0.18	5
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Anxious	Social self-efficacy	0.03	-0.03	0.4	-0.001	5
Wei et al. (2007) US	390	Mixed	Non clinical	Adult	Avoidant	Social self-efficacy	0.06	-0.03	0.2	-0.002	5
Wijngaardsde et al. (2007) Neetherland	438	Mixed	Non clinical	Adult	Anxious	Relational satisfaction	-0.33	-0.26	0.31	0.09	6
Wijngaardsde et al. (2007) Neetherland	438	Mixed	Non clinical	Adult	Avoidant	Relational satisfaction	-0.12	-0.26	0.33	0.03	6
Williams et al. (2004) US	291	Mixed	Non clinical	Adult	Anxious	Dysfuntional attitudes	0.26	0.35	0.46	0.1	3
Ying et al. (2007) US	122	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.09	-0.68	-0.08	-0.0612	6
Ying et al. (2007) US	122	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.27	-0.68	-0.2	-0.1836	6
Ying et al. (2007) US	121	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.39	-0.56	-0.29	-0.2184	6
Ying et al. (2007) US	121	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.3	-0.56	-0.19	-0.168	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Ying et al. (2007) US	110	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.24	-0.63	-0.22	-0.1512	6
Ying et al. (2007) US	110	Mixed	Non clinical	Adult	Other	Low sense of coherence	0.23	-0.63	-0.12	-0.1449	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.67	0.05	0.42	-0.0335	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.16	0.05	0.22	-0.008	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Anxious	Relational conflict	0.15	0.17	0.42	0.0255	6
You et al. (2015) Hong kong	153	Mixed	Non clinical	Adult	Avoidant	Relational conflict	0.39	0.17	0.22	0.0663	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.32	0.09	0.4	-0.0288	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.1	0.09	0.22	-0.009	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Anxious	Relational conflict	0.18	0.13	0.4	0.0234	6
You et al. (2015) US	214	Mixed	Non clinical	Adult	Avoidant	Relational conflict	0.13	0.13	0.22	0.0169	6
Zhu et al. (2016) China	363	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.13	-0.22	0.29	0.03	6

Author/s (Year) Country	Sample	Gender	Clinical vs. Non-clinical	Develop-mental Stage	Insecure attach-ment (IV)	Mediator	Path *a*	Path *b*	Path *c*	*a*b*	Quality rating
Zhu et al. (2016) China	363	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.13	-0.22	0.02	0.03	6
Zhu et al. (2016) China & US	726	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.25	-0.203	0.33	0.05	6
Zhu et al. (2016) China & US	726	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.33	-0.23	0.18	0.07	6
Zhu et al. (2016) US	363	Mixed	Non clinical	Adult	Anxious	Perceived social support	-0.2	-0.11	0.32	0.02	6
Zhu et al. (2016) US	363	Mixed	Non clinical	Adult	Avoidant	Perceived social support	-0.25	-0.11	0.23	0.03	6

Note. **Path *a*:** association between independent variable and mediator; **Path *b*:** association between mediator and dependent variable; **Path *c*:** total effect of the independent variable on the dependent variable; ***a*b*:** the indirect effect of the independent variable on the dependent variable controlling the mediator

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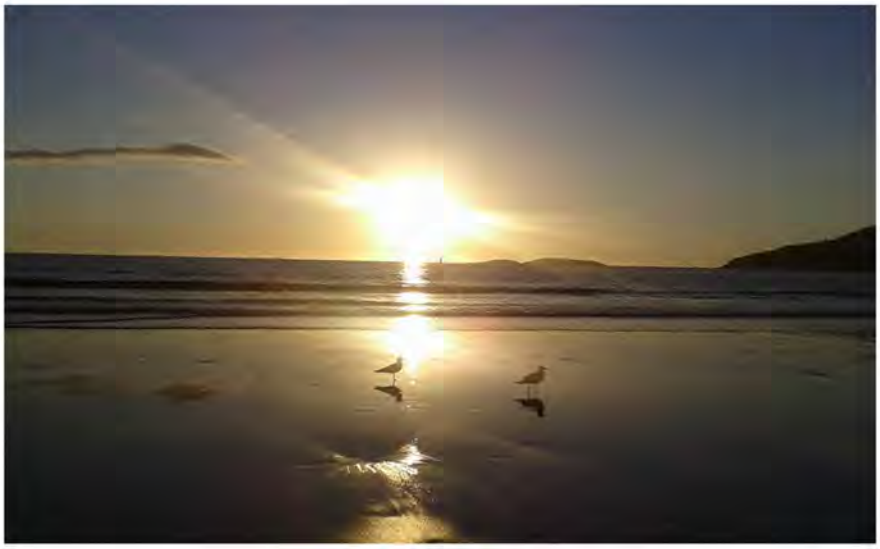

This thesis examined the reciprocal associations between insecure attachment (mother, father, peers) and eating and depressive symptoms in the transition to adolescence, mediators that govern these associations and an explanatory model of the interrelation between such variables. Overall, secure attachment, particularly to mother, protects against the development of psychopathology, and this influence has a reciprocal nature over time. Parenting programs that promote communication and problem-solving skills to facilitate the normative process of adolescent autonomy, and interventions focused on negative emotions-cognitions rooted in early representations, can prevent the development of these symptoms.